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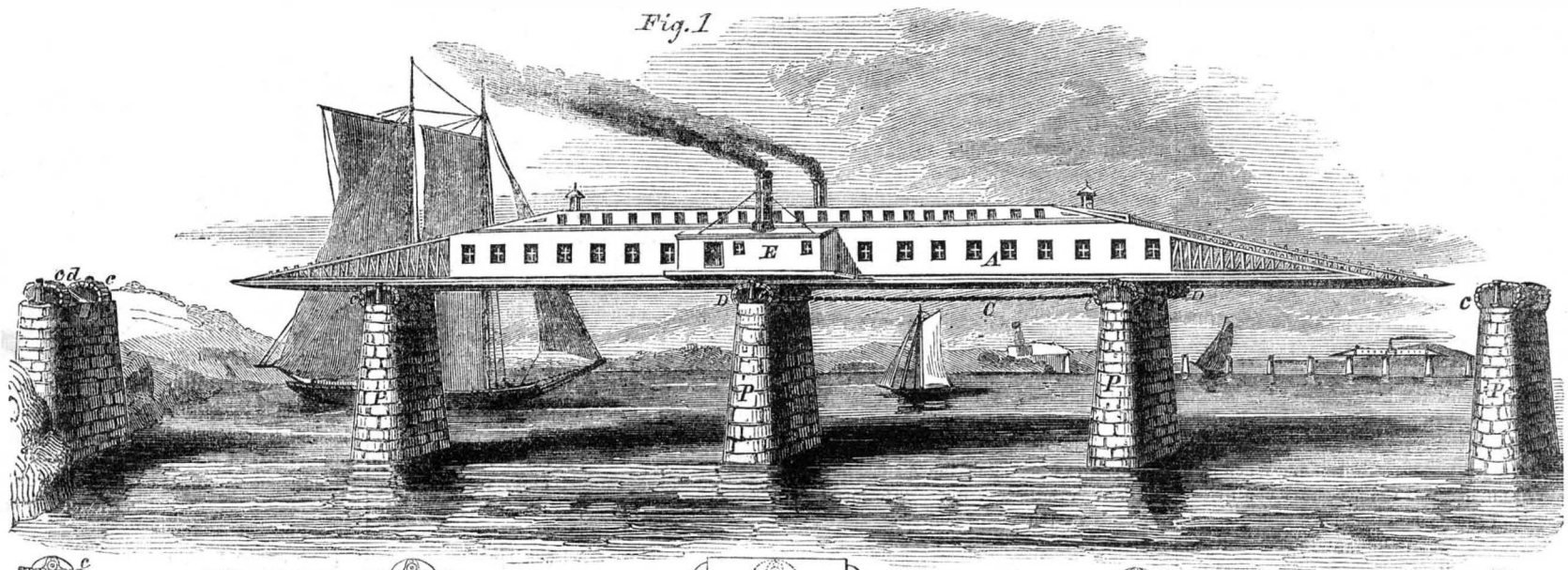
FIELD'S TRAVELING BRIDGE.

The annexed engravings illustrate the traveling bridge for which a patent was issued on the 25th of April, last year, to Frederick Field, formerly of Michigan, but now of No. 15 Laight street, this city (N. Y.) Fig. 1 is a perspective view of a bridge in motion, according to this plan. Fig. 2 is a plan view. Fig. 3 is a perspective view of a pier with its guide and anti-friction rollers. Fig. 4 is a cross section of the spring grip posts on the center of a pier, and fig. 5 is a transverse section of the guide post, *g*. Similar letters refer to like parts.

The nature of the invention consists in a new mode of crossing navigable rivers without obstructing navigation, the main feature of which is a traveling bridge propelled over and upon piers, so placed in the water as to leave sufficient room between them to allow vessels to pass. A is the traveling bridge, which can be built with a cabin for passengers, a space for carts and carriages, or for railway cars in the middle. E represents an engine house, with engine and boiler on each side, to move the bridge. P P P represent piers built in the river, at proper distances apart, to allow vessels to pass between them, and to allow the bridge to be sustained and properly balanced on them, according to its length, while in motion. *c c* are belts of friction rollers, secured in boxes in each pier, to allow the bridge to slide over easily. *g g* are guide posts with roller caps, one on each side of a pier; they have top flanges, which take into a long channel in the side of the bridge, and serve to guide and keep it steady. On the bottom of the bridge there are two sprocket wheels, D D, on two shafts, and over these pass an endless chain, C, which is made

Fig. 1



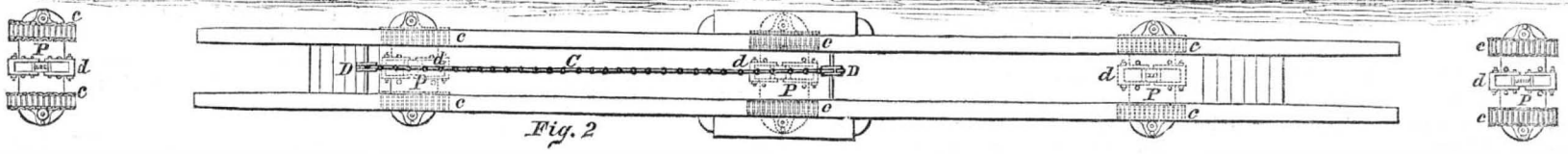


Fig. 2

with links to take into the center cog, *f*, of the spring post, *d*, and work like a pinion and fixed rack. The engines in the bridge are geared to drive the shaft of one sprocket wheel, D, and the chain thereby gives motion, by taking into the cog post, *f*, on the pier, and thus acting to move forward the bridge. When the end of the chain, C, comes to a pier, it is necessary to be released from biting or catching on the cog, *f*. This is done by a cam placed on each side of the sprocket wheel, D, which cams press upon the adaptable incline ways, *e e*, of the spring post, *d*, and force *f* down below the level of contact with the chain, C, thus allowing the bridge to roll along from pier to pier, as shown. This embraces the whole of the parts of this bridge, and the mode of its operation, all being very simple and plain. It will also be observed, that no sooner does the cam wheels on the shaft of the sprocket, D, on the forward end of the bridge pass over the cog, *f*, than it, the spring cog, immediately springs up and takes into the link of the chain.

The following are the results of an estimate of the dimensions and capacity of the Traveling Bridge made by the patentee:

"A bridge 600 ft. long, its gravity 400 tuns, will transport a train of cars 400 feet long, 250 tuns, locomotion included; spaces between the piers 150 feet; tractive power, when the friction rollers are used, will be 1500 lbs.; if wheels with axles are used, the tractive power will be 5625 lbs.; speed 4 miles an hour. Steam power equivalent to that of an ordinary locomotive where the axle wheel is used, but where the friction rollers are used the power may be reduced in the same ratio with the traction required. Presuming the main heft of the bridge to rest equally upon three piers; the lateral pressure upon the piers when motion is produced, will be as follows:—When only one chain is used, the lateral pressure on the pier to which the chain is attached will be ⅔ of the amount of the tractive power required to produce motion, and that in a direction opposite to the one in which the bridge moves; and upon the other two piers will be each ⅓ of the same amount, in the direction the bridge moves. If three chains are used, drawing upon three pins, the traction on the chain will just equal the amount of friction to be overcome upon each pier, hence an equilibrium will be the result, atmospheric retistance and tendency to quiescence excepted."

The main design of the inventor in the construction of this traveling bridge, is to provide railroad companies with a convenient method of crossing navigable rivers where drawbridges are objectionable, but it may also be used as a substitute for a ferry boat. It is designed to afford the means of crossing broad rivers, over which the expense of constructing long bridges are very great, and the keeping of them in repair no less so.

At such places as Albany, N. Y., and Havre de Grace, Md., where ferry boats are used to cross the rivers, to connect railroad lines, and where the waters are frozen in winter, such a bridge would afford convenient crossing during all seasons. The idea is a novel and bold one. Can it be carried out successfully, or is it inoperative? Several distinguished engineers, we have been informed, have pronounced a favorable verdict, and concur in the opinion that it is economical and practicable. That such a bridge can be constructed and operated, who can doubt, in the present advanced state of engineering in our country. Of course it is not to be expected but improvements will be made upon it, but its economy in all its workings, is the main question.—What company or association will first test this on a scale of sufficient magnitude. We hope we have more than one that will do this.

Fig. 3

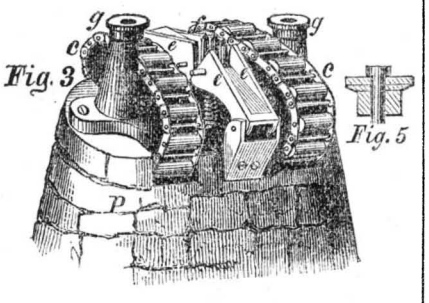
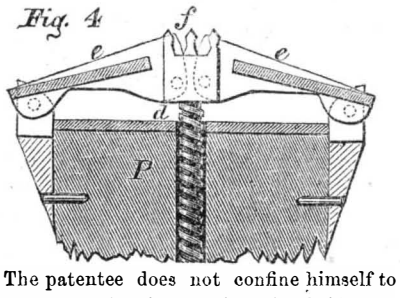


Fig. 5

Fig. 4



The patentee does not confine himself to the exact mode of propelling the bridge, as here represented.

More information may be obtained of the patentee by letter addressed to (or otherwise) him at his residence, mentioned above, where a working model can be seen.

Tailed Men.

In London, our foreign exchanges say there is on exhibition a man, woman, and child of the *Niams* from Central Africa, a tribe which have the vertebræ so prolonged as to form a tail. It is our opinion tha t these are relatives of the wooley horse.

Saponaceous Cream of Almonds.

The preparation sold under this name is a potash soft soap, made with lard and perfumed with essential oil of almonds. It has a beautiful pearly appearance, and makes an excellent lather with a brush, and has met with an extensive demand as a shaving-soap, especially in Paris. It is prepared thus:—Take of fine clarified lard, 7 lbs.; of potash lye, containing about 26 per cent. of caustic potash, 3 lbs. 12 oz.; of rectified spirit, 2 oz.; of essential oil of almonds, 2 drachms. Melt the lard in a porcelain vessel, by a salt water bath or a steam heat under 15 lbs. pressure, then let in the lye *very slowly*, agitating continually from right to left during the whole time; when about half the lye is run in, the mixture begins to curdle; it will, however, finally become so firm and compact that it cannot be stirred, if the operation is successful. The soap is now finished, but is not pearly; it will, however, assume that appearance by long trituration in a mortar, gradually adding the alcohol, in which is previously dissolved the perfume.

SEPTIMUS PIESSE.

London.

Wooden Car Springs.

Most of the cars in the Pennsylvania coal trade have wooden springs. These are simply two pieces of ash, say eight feet long and six by two inches, bolted together, and supporting the boxes. As the result of three years' experience, it has been found the first cost of the wooden springs is but one-third that of steel, and the cost of maintenance less than one-half.

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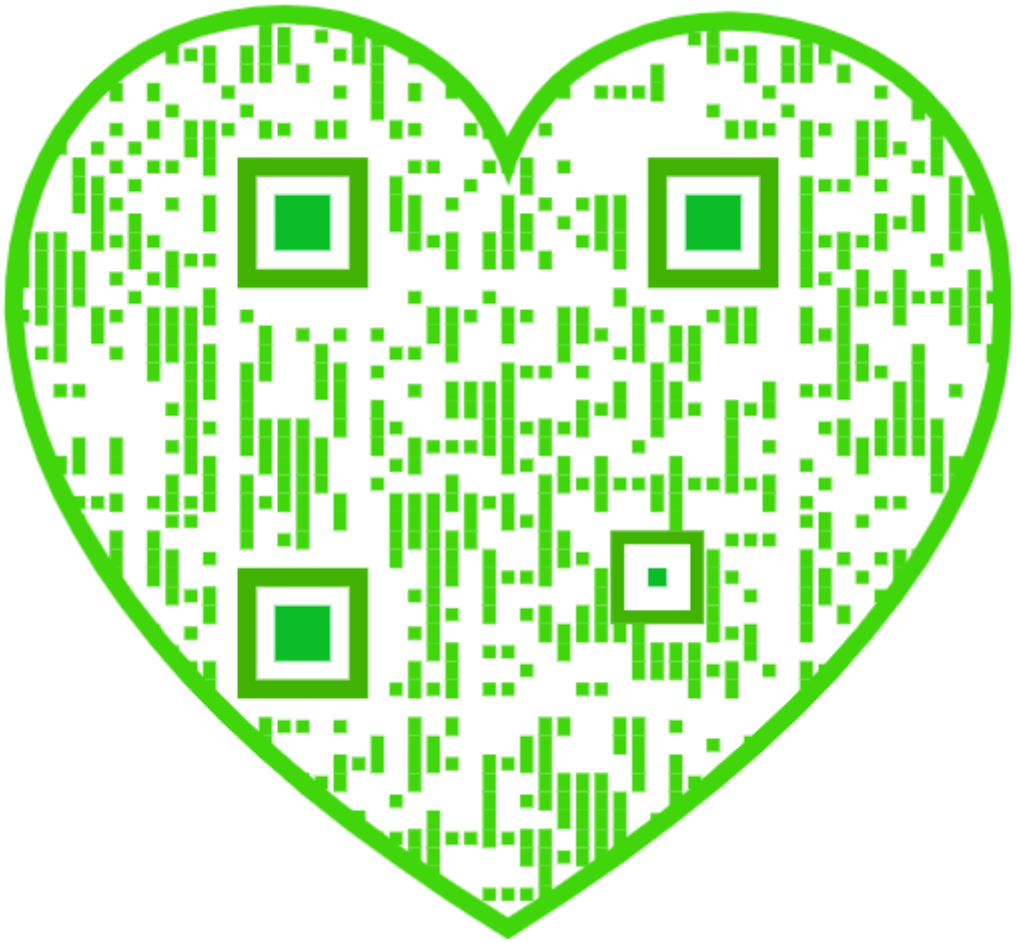

The Art of Dyeing—No. 9.

THE PASTEL VAT—The following is taken from Dumas' lecture on dyeing, describing the pastel vat. Various substances are employed for dyeing blue in vats, but, after all, indigo is the main one.

"The first care of the dyer in preparing the vat should be to furnish the bath with matters capable of combining with the oxygen, whether directly or indirectly, and of giving hydrogen to the indigo. We must, however, be careful to employ those substances only which are incapable of imparting to the bath a color which might prove injurious to the indigo. These advantages are found in pastel, woad, and madder. This latter substance furnishes a violet tint when brought in contact with an alkali, and by the addition of indigo it yields a still deeper shade.

The pastel vat, when prepared on a large scale, ordinarily contains from 18 to 22 lbs. of indigo; 11 lbs. of madder would suffice for this proportion, but we must also bear in mind the large quantity of water which we have to charge with oxydizable matters. I have invariably seen the best results from employing 22 lbs. to a vat of this size. Bran is apt to excite the lactic fermentation in the bath, and should therefore not be employed in too large a quantity; 7 to 9 lbs. will be found amply sufficient.

Weld is rich in oxydizable principles; it turns sour, and passes into the putrid fermentation with facility. Some dyers use it very freely; but ordinarily we employ in this bath an equal quantity of it to that of the bran. Sometimes weld is not added at all.

In most dye-houses the pastel is pounded before introducing it into the vat. Some practical men, however, maintain that this operation is injurious, and that it interferes with its durability. This is an opinion which deserves attention. The effect of the pastel, when reduced to a coarse powder, is more uniform; but this state of division must render its alterations more rapid. When the bath has undergone the necessary ebullition, the pastel should be introduced into the vat, the liquor decanted, and, at the same time, 7 or 8 lbs. of lime added, so as to form an alkaline lye which shall hold the indigo in solution. Some thick coverings are to be spread over the vat, so as to preserve it from contact with the atmosphere. After this lapse of time, it is to be again stirred. The bath at this moment presents no decided character; it has the peculiar odor of the vegetables which it holds in digestion; its color is of a yellowish-brown.

Ordinarily, at the end of twenty-four hours, sometimes even after fifteen or sixteen, the fermentative process is well marked.

The odor becomes ammoniacal, at the same time that it retains the peculiar smell of the pastel. The bath, hitherto of a brown color, now assumes a decided yellowish-red tint. A blue froth, which results from the newly liberated indigo of the pastel, floats on the liquor as a thick scum, being composed of small blue bubbles, which are closely agglomerated together. A brilliant pellicle covers the bath, and beneath some blue or almost black veins, owing to the indigo of the pastel which rises towards the surface. If the liquor be now agitated with a switch, the small quantity of indigo which is evolved floats to the top of the bath. On exposing a few drops of this mixture to the air, the golden yellow color quickly disappears, and is replaced by the blue tint of the indigo. This phenomenon is due to the absorption of the oxygen of the air by the indigogen from the pastel; in this state we might even dye wool with it without any further addition of indigo; but the colors which it furnishes are devoid of brilliancy and vivacity of tone, at the same time the bath becomes quickly exhausted.

The signs above described, announce, in a most indubitable manner, that fermentation is established, and that the vat has now the power of furnishing to the indigo the hydrogen which is required to render it soluble—that contained in the pastel having been already taken up; this, then, is the proper moment for adding the indigo, which should be previously ground in a mill.

The ordinary guide of the dyer is the odor, which, acoording to circumstances, becomes more or less ammoniacal. The vat is said to be either soft or harsh; if soft, a little more lime should be added to it. The fresh vat is always soft; it exhales a feeble ammoniacal odor, accompanied with the peculiar smell of the pastel; we must, therefore, add lime to it along with the indigo; we usually employ from five to six pounds, and, after having stirred the vat, it is to be covered over. The indigo, being incapable of solution except by its combination with hydrogen, gives no sign of being dissolved until it has remained a certain time in the bath.—The hard indigoes, as those of Java, require at least eight or nine hours, whilst those of Bengal do not need more than six hours, for their solution. The vat should be examined three hours after adding the indigo; the odor is by this time weakened; we must now add a further quantity of lime, sometimes less, but generally about equal in amount to the first portion; it is then to be covered over again, and set aside for three hours.

After this lapse of time, the bath will be found covered with an abundant froth and a very marked copper-colored pellicle; the veins which float upon its surface are larger and more marked than they were previously; the liquor becomes of a deep yellowish-red color. On dipping the rake into the bath, and allowing the liquid to run off at the edge, its color, if viewed against the light, is of a strongly-marked emerald green, which gradually disappears, in proportion as the indigo absorbs oxygen, and leaves in its place a mere drop rendered opaque by the blue color of the indigo. The odor of the vat at this instant is strongly ammoniacal; we find in it, also, the peculiar scent of the pastel. When we discover a marked character of this kind in the newly formed vat, we may without fear plunge in the stuff intended to be dyed; but the tints given during the first working of the vat are never so brilliant as those subsequently formed; this is owing to the yellow coloring matters of the pastel, which, aided by the heat, become fixed on the wool at the same time as the indigo, and thus give to it a greenish tint.—This accident is common both with the pastel and the woad vats; it is, however, less marked in the latter.

When the stuff or cloth has been immersed for an hour in the vat it should be withdrawn; it would, in fact, be useless to leave it there for a longer time, inasmuch as it could absorb no more of the coloring principle. It is, therefore, to be taken from the bath and hung up to dry, when the indigo, by attracting oxygen, will become insoluble and acquire a blue color. Then we may replunge the stuff in the vat, and the shade will immediately assume a deeper tint, owing to renewed absorption of indigo by the wool. By repeating these operations, we succeed in giving very deep shades. We must not, however, imagine that the cloth seizes only on that portion of indigo contained in the liquor required to soak it. Far from such being the case, experience shows that, during its stay in the bath, it appropriates to itself, within certain limits, a gradually increasing quantity of indigo. We have here, then, an action of affinity, or, perhaps, a consequence of porosity on the part of the wool itself."

A New Method of Extracting Bullets.

The frightful list of wounded soldiers at the battle of Inkerman, and the difficulty of extracting bullets, has suggested to Izra Miles, of Stoke Hammond, England, the application of the same principle in extracting bullets that has been applied in sinking hollow piles, as illustrated on page 1, Vol. 8, SCIENTIFIC AMERICAN. The contrivance is very simple, consisting of a small air-pump and cylinder, to which a tap is affixed. To this tap is attached a suitable length of flexible tubing, about a quarter of an inch in diameter, lined inside with silver wire to prevent its collapsing. At the other end of this tube there is a small globe, from which a tube sufficiently minute to pass into a bullet wound is fixed, the end terminating with an india-rubber collar. On the top of the globe there is a small tap in order to admit a probe to pass down the tube to sound when on the bullet. The mode of operation is this:—A vacuum is created in the cylinder, the tube before alluded to is passed into the wound, and when it is ascertained to be on the ball, the tap in the cylinder is opened, when the bullet becomes fixed to the tube by the vacuum thus created, and is withdrawn. The great merit of this invention consists in its obviating the necessity for the painful and dangerous operation of cutting out bullets, and by its means a medical man, with the aid of an assistant to work the air-pump, would be able to accomplish the work which now occupies many surgeons. When the cylinder is once exhausted, it would extract several bullets without the necessity of again working the air-pump. The Medical Board of the Army has given directions to an eminent instrument-maker to fit up the apparatus.

Ballanced Steam Valve.

In our list of claims on another page is the name of John Tremper, of Philadelphia, who has obtained a patent for an improved ballanced valve. The nature of the invention consists in a ring valve without an opening through its sides, which is employed in a casing in connection with a suitable arrangement of passages and a fixed cup having a passage or passages leading from one side to the other of it. The steam being admitted through the center of the ring valve, presses equally on all sides, and ballances it perfectly. When the ring valve is down it rests upon the cup named, and closes the passages for steam around the sides, and when it is lifted up, the steam passes through the ring valve, past the sides of the cup and into the cylinder. A guard ring is also employed above the valve ring, in order to keep the valve steady during the rush and intermission of the steam by the successive strokes of the engine. The ring valve is raised and lowered—to open and close the passages around the fixed cup, by means of a toggle joint, one arm of which is connected with the valve, and the other with a spindle passing transversely through the casing, and connected to the machinery that controls the valve. The toggle joint is so arranged that it is fully extended when the valve is closed, so that it limits its movement, and lets the valve drop steam tight into its seat. It also opens and closes the valve by such a nice motion as to prevent jamming, giving a slower motion at the closing, and a quicker one the further it is from its seat. This is a most beautiful and simple valve. Mr. Tremper—to our knowledge—has devoted his attention, for the past nine years, to improvements in steam engines, and has obtained a number of patents during that period. His very unique and ingenious governor for steam engines was illustrated on page 244 Vol. 8, SCIENTIFIC AMERICAN.

New Life Boat.

The improved life-boat, for which a patent has been granted to H. Berdan, whose claim will be found on another page, is of a very novel construction of frame to support and sustain in its proper shape a covering of india rubber or water-proof cloth. The frame to which the cloth is secured consists of a keel, stem, stern post, ribs, and gunwale bars. The ribs are jointed to the keel and gunwale bars, and the gunwale bars are hinged to the upper part of the stem and stern post. This frame, therefore, can be folded up—collapsed as it were—when the boat is not required and extended rapidly when required, and can be packed into a very small space. It can also be transported so easily as to form an excellent army boat for crossing rivers, as well as a convenient life-boat, a great number of which might be easily carried on every ship.

Plow Standards.

The improvement in plows, for which Geo. Esterly, of Heart Prairie, Wis., has just obtained a patent, and whose claim is in this week's list of claims, consists in the peculiar construction of the standard which is so constructed that mold boards of different sizes may be secured to it, likewise shares of different thicknesses, to adapt it for plowing different soils. The improvement is therefore designed to make one plow more universal in its application to different kinds of work.

Felting Hats.

The improvement in machinery for felting hat bodies, for which a patent has just been issued to Wm. Fuzzard, of Newark, N. J., consists in the employment of a pair of corrugated rollers, placed in a swinging frame, combined with an endless apron working over a driving drum between the corrugated rollers. Corrugated rollers have been used before in hat felting machines, but not arranged in the same manner. The advantage claimed for the improvement, is a nice graduation of the pressure of the rollers upon the hat bodies, which is very important at first, when the hat bodies are put in the machine, as they are then very tender, and liable to be ruptured. In this new machine, a very light pressure, like that of hand pressing, is first given to the hat bodies, until they are partly felted, and have acquired more strength, when the pressure is increased by further depressing the swinging frame.

Notice to Engineers and Pilots.

Circumstances render it necessary, owing to various reports injurious to the character and good standing of engineers and pilots licensed at this Board, that before renewal of licenses can be obtained, they (the applicants) will be required to furnish testimonials; and be qualified, too, should it be found necessary, from the officers of the several steamboats on which the applicants were engaged during the last twelve months, setting forth their entire sobriety and steady habits, as well as strict attention to their relative duties. Testimonials from those of the same profession, unless he or they be in command of the steamboat at the time of the employment of the applicant, cannot be received. (Signed) JAS. H. M'CORD,
H. SINGLETON.

St. Louis, Mo., Jan. 4th, 1855.

[The above rule, established by the Inspectors for the St. Louis District under the new Steamboat Law, is an excellent one, and should be adopted by the Inspectors in all the other districts.

Power of Locomotives in Overcoming Steep Grades.

In completing the railways between Turin and Genoa, some important experiments have been made as to the ascent that could be accomplished by peculiarly constructed locomotives. The following result is given by a correspondent of the London *Times*:

"The experiments already made on the incline near Gleni, where there is an ascent of 1 in 28 1-2, have been most satisfactory.—With two locomotives attached together, drawing a train of six carriages loaded with sand, which weighed altogether about 56 tuns, and each locomotive weighing about 22 tuns, including the coal and water, a speed of 19 English miles an hour was easily accomplished, although, from the length of the tunnel and the dampness of the atmosphere, the rails were excessively greasy and slippery, The engines used were built by Messrs. Stephenson, after plans sent by the Piedmontese engineers, and as this is at present the steepest ascent on any railroad in Europe, the result reflects in the highest praise on all concerned, particularly considering the signal failure of the former engine, "la Bavaria," for which the Austrian government paid so highly for crossing the Simmering, and which can hardly force its own weight of 60 tuns up an incline of 1 in 40."

We do not know whether the Piedmontese engineers were Italians or French; if the former, they deserve double praise, because they have not had any experience whatever in the construction of locomotives.

Anthracite Coal or Steamships.

Anthracite coal is now being used by some of the British steamships The *Great Britain* used it with success on her last trip to Australia.

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(For the Scientific American.)

Muntz Metal for Bolts.

I feel much interested in the article in the last week's SCIENTIFIC AMERICAN, in relation to the use of Muntz metal, or compounds of copper and zinc for sheathing and bolting of vessels; having on several occasions noticed the deterioration of tenacity in brass rods, wires, &c., after being in use for considerable periods of time. Mr. Armstrong attributes the decay to electrical action, induced when Muntz metal or brass is exposed to the action of sea water, as the altered appearance of the metal sufficiently indicates; its nature seemed to be quite changed, having more the appearance of brown earthenware than brass. In the cases in which I have noticed the decay of tenacity in brass, the metal was exposed to the air, or at most to fresh water, and the metal in each instance had become crystalline, retaining, however, its metallic appearance. This change appeared to be due to irregularity of strain exerted on the brass, it having been long subjected to sudden, alternating, or jerking strains in the direction of its length. Sudden strains or concussions in the direction of length, tend to draw the molecules of brass apart, and perhaps, after a time, separate them beyond the sphere of their mutual attraction, and so impair the tenacity of brass wire bars, &c.

To test the truth or probability of the foregoing, the following experiment was tried:—About six years since my office bell was removed to the dwelling, about one hundred feet distant, and about eighty feet of very stout and good brass wire was joined to the end of the copper bell-wire attached to the handle, the brass wire passed through the yard for forty feet, then through a shed for twenty feet, and through another yard to the house, where the bell was hung. There were six bell cranks used for turning angles, and when the whole was finished, it required a pretty strong pull to ring the bell in the house. All answered very well for about five months, when the brass wire broke; with some difficulty, owing to the now brittle state of the brass wire, it was mended, and after a few more breaks and repairs, the greater part of the wire fell to the ground, and the whole of it became brittle, breaking when an attempt was made to bend it. The remnant of brass wire not used remained as good as at first. Small portions of the brittle wire were examined, and found to retain their tenacity in the direction of the diameter of the wire.

The instances in which this decay of tenacity was noticed, was in wire drawn brass, or perhaps it had been passed through a grooved roller; this is a subject worthy of a thorough investigation. In the above experiment the brass circular rims of the bell cranks were less stout than the brass wire, and were subjected to the same straining as the wire, yet they remained uninjured; now if the Muntz metal bolts are made by rolling or drawing through die-plates, will not this latent predisposition to weakness in wire-drawn brass cause the bolts soon to lose their tenacity, without any reference to the electrical action of sea water on the bolts? The sea water would probably act as a powerful accelerating force to help to destroy the tenacity of the brass bolts. It is not pretended that wire-drawn brass, when used for regular and gentle strains, amounting to a small fraction of the strength of the metal, will be seriously injured in any reasonable time. What is meant is, that brass bolts so prepared are probably unsafe, and that when subjected to the severe and uncertain straining they would be exposed to in ships, in foul weather, would soon become weak and useless.

J. T.

[This is very useful information on this subject. Armstrong also pointed out the deterioration in the sheathing, of ships and his inference was a very plausible one, namely, an electric action.

Wind Mills.

MESSRS. EDITORS—In No. 20, page 156, SCIENTIFIC AMERICAN, this sentence occurs:

"Mr. Curtiss intends to try his wheel (wind wheel) on a propeller, so as to try what wind can do with his sails in moving a vessel directly against itself."

This question arises: Will not the same force employed in turning the screw or the paddle-wheel to move the craft against the wind, be also exerted against the wind-sails in an opposite direction, so that the two forces will stand as equivalents in a mutual resistance; then add the force or amount of the wind against the vessel, and it will be driven to windward. Not long since, the same project was started in the vicinity of our Oneida lake, but I believe the inventor was reasoned out of the experiment.

Now, Sir, as you have just come out of the Ericsson furnace of hot-air, you are presumed to be posted in these matters, and we look to you for a solution of the question.

A. OSBORN.

Albany, Feb. 11th, 1855.

[As action and re-action are equal, the wind mill will not be able to propel a vessel directly against the power that drives it.

For the Scientific American.

Soup as Food, and how to Make it.

In your valuable paper of Jan. 27th—a number of which has just fallen into my hands—I notice an article with the first part of the above caption, which has induced me to say something on the same subject. With your comments on the extracts from the *Country Gentleman*, I most fully concur, and your exposé of the fallacy of the reasoning contained in it—if reasoning it can be called. But not on that, but on the making of soup I wish here to say something.

Really good soup is a dish very rarely to be met with—not because of the difficulty of making it, I presume, but because of ignorance in making it. There are very few cooks who know how to make it! The broth water, made by boiling a piece of beef, mutton, chicken, &c., a little while, and then taking it out, and stirring in a little flour or corn meal, is not soup, and does not deserve the name. To make good soup requires much boiling—some two or three hours, or more. And it should not be deprived of the meat when taken to the table, or at least all of it, used in making it, but the meat used should be chopped or cut up very fine, when put in the water to make it, and suffered to remain in it, or a good portion of the meat. It should also have the addition of vegetables, where these can be procured, which should also be cut up in it, when put on to cook, and a pod or two of red pepper, to season it with, which makes it much more healthful, particularly in cold weather.—And not any particular kind of vegetables, or one kind only at a time, but it will admit of having almost every sort put in it—and that too at the same time, or in the same dish. Generally speaking, the more you put in the better—potatoes, cabbage, onions, carrots, salsify, shallots, &c., all except beets, sweet potatoes, and perhaps a few others. Fruits, as apples, peaches, &c., are, of course, excluded, and belong, properly, to deserts. The reason for thus boiling soup so long in making it, is to extract the gelatinous portion of the meats—a most important and nutritious principle—and which gives the fine, rich, and peculiar flavor that renders it so palatable and nourishing—and which the "broth water" we have spoken of, has not. This, as is well known, is only to be extracted from meat by long boiling, and by its being divided into small bits. Hence bones, from which the flesh has not been too closely stripped, make the best soup, particularly the parts about the joints, where the ligaments and tendons are, as these contain the most gelatin. And the marrow in bones also add much to the richness and flavor of soup. They should be sufficiently broken or crushed. But the more gelatine the better the soup. There is also economy in the use of bones and bits of meat not fit for the table, and by leaving them in the soup there is no need of eating meat separately. These hints are given, in the hope that they may be beneficial, by A PHILANTHROPIST.

Paduch, Ky.

Linseed oil varnish is perhaps the best that can be used for protecting polished articles of steel.

Painting and Varnishing Carriages.

MESSRS. EDITORS—On page 131 SCIENTIFIC AMERICAN, there is an article on painting, which contains some excellent receipts, but near the close of it there is one which might lead some of your readers to spend their time and money for nothing. Your correspondent says, "Persons wishing to paint their carriages black should put on one coat of lead color, when dry, sand paper well, and finish with copal varnish and a little lamp-black." This will do very well for any article that is not exposed to wet weather. But every person who knows the nature of copal varnish knows that wherever a drop of water stands for any length of time, on any surface varnished with it, it leaves a white or grayish spot. Every person skilled in the art of coach painting will agree that copal varnish is not fit for carriages. Nothing should be used but the best quality of coach varnish.

J. R. G.

North Liberty, Ohio, Feb. 11th, 1855.

Grafted Chestnut Trees.

The Cincinnatti *Gazette* publishes an interesting letter from Mr. Sheldon I. Kellogg, to the Wine-Growers' Association, dated Bordeaux, France, on the cultivation of the chestnut. He says:

"I have been much surprised in seeing the great dependence the poorer classes make upon the large chestnut for their daily food. It is cultivated in this neighborhood in great abundance for this purpose. All classes use them more or less; the rich having them daily brought upon their tables as desert, either boiled or roasted. It is often made into a soup, which is highly esteemed. They are cooked in a multitude of ways, and I know of nothing of a farinaceous nature which is so very delicate and nourishing.

The marron, or large chestnut, is the produce of the wild chestnut after being engrafted. The wild tree, at three or four years of age, is cut square off, say four or five feet from the ground. The stump is then split twice. These splits intersect at right angles at the center of the stump. There is then inserted one good-sized branch of the same tree in every section of the splits, making four branches in each stump. Care is always taken to make the bark of the branches and the bark of the stump join each other as closely as possible. The graft is then surrounded with clay and moss, to prevent the outflow of the sap, and it scarcely ever fails of success. The period selected in this climate for this operation is the month of February. The produce of this graft is usually a fine, large, beautifully colored marron, about the size of our buckeyes. They are much more delicate in texture and flavor than our own wild chestnut. They are never eaten without being cooked. The tree is a very beautiful one, being, though not so high as ours, much more dense in foliage, and shading a larger space of ground."

[We have directed attention a number of times to the cultivation of the chestnut, and we publish the above hoping it will effect some good.

Prof. Agassiz on the Smithsonian Institute.

This distinguished man of science has addressed a letter to Mr. Upham, M. C., in relation to the controversy now raging about the management of the Smithsonian Institute, in which he sustains the course pursued by Prof. Henry and the present Board of Regents, and indirectly condemns the policy advocated by Mr. Choate. In the course of the letter he takes the ground that the Smithsonian Institute is not strictly an American institution, but that it was designed by its founder "to increase and diffuse knowledge among men." He also mentions a curious fact, bearing upon the present controversy, going to show that the testator designed that his bequest should be appropriated to the publication, rather than to the accumulation of books. He says that the whole bequest was originally made to the Royal Society of London, but afterwards transferred to the United States because the Society refused to publish certain scientific papers submitted to them for that purpose.

The Steam Fire Engine.

A steam fire engine, built in Cincinnati, at the shop of the Brothers Latta, and purchased for the city of Boston, was tested in this city on last Saturday morning. It was tested alongside of one of our best city engines, No. 42, and the result was a complete triumph of steam over human muscle.

The great and important feature in the steam fire engine is the rapidity with which steam is got up. On this occasion the time occupied from kindling the fire till the engine was working was only six minutes. It sent up two large streams, steady and full, far above the single stream of No. 42. The steam fire engine is destined to supersede the hand one in all our cities.

The Earthquake at St. Johns.

The news which we have received of the late earthquake in New Brunswick, as noticed by us last week, makes it a more serious affair than we had imagined. In the city of St. Johns the shaking of the buildings was violent. The walls of brick buildings trembled, windows were broken, and the people greatly frightened, but no material damage was done. A shock as violent was felt throughout the same part of the continent about 38 years ago.

A New Potato.

A. B. Gray, during his recent explorations across the continent, for the purpose of ascertaining the practicability of constructing a railway to the Pacific, discovered a remarkable plant at the head of the Gulf of California, it being found in abundance through a range of naked sand hills skirting Adair Bay. It is described as a parasitic plant, with a large and fleshy root, and has been called "Ammabroma Sonoræ," signifying Sand Food of Sonora. The fresh plant is cooked by roasting upon the hot coals, and resembles the sweet potato in taste, having much saccharine matter in it.

Hickory Nut Oil.

The Toledo *Republican* states that hickory nut oil, considered equal to the best lard or sperm oil for burning and machinery, is manufactured by Mr. Warren Eastbrook, of Dayton, Ohio. The nut oil remains in a fluid state at very low temperature, and it does not "gum" like the ordinary qualities of oil. It is used in very delicate machinery, and when properly refined could be used by watchmakers. Mr. Eastbrook believes that oil manufactured from the ordinary shell bark, and large sweet hickory nut, will come into general use for the table.

Pennsylvania Commissioners to the Paris Fair.

We have received a circular, issued by the Commissioners of Pennsylvania, who have been appointed by the Executive of that State to represent it at the Universal Exhibition in Paris. They invite contributions from artisans, mechanics, inventors, manufacturers, and agriculturists to the Exhibition, which will open on the first of May next. Pennsylvania should make a considerable show in Paris, as no less than ten Commissioners have been appointed.

Manufacture of Alcohol from Asphodel Root.

It has been observed in Algeria that the tuberous roots of asphodel yield alcohol, on fermentation, in considerable abundance. Its exact source is unknown, since the roots appear to contain neither sugar nor starch. The yield is eight per cent., or double the amount obtained from beet root. It is very possible that during the high price of alcohol, consequent upon the grape-blight, this new branch of industry may prove highly important.

Importing Turnips.

A vessel recently arrived at this port from Glasgow with 56 tuns of turnips. What are our farmers about that both potatoes and turnips have been sent over from Britain this winter.

By the most recent news from Europe, the British Ministry had resigned, and there was a tremendous flare-up in Parliament.

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New Inventions.

Supporting Articles of Dress.

The patent granted in this week's list of claims, to John Dick, of this city, for a method of supporting articles of dress, is at once useful, simple, and ingenious. It consists in having two or more supporting pieces of whalebone, wood, rattan, or steel, or any other material possessing sufficient elasticity and stiffness, applied to such part of a garment as is liable to become wrinkled—like the waists of ladies' dresses, or the spring part at the foot of pantaloon legs—by the movements of the body or limbs, or otherwise, and so arranging these pieces—whalebone, &c.,—as to allow perfect freedom of the body, and the returning of the article of dress to its former extended smooth surface, after being contracted by the motion of the body. The spring extenders of Mr. Dick are so arranged as to contract and pass one another as into a sheath, so as to allow the article or the part of dress to which they are applied, to contract, and then expand again, with the greatest facility.

Invincible Horse Bit.

The patent granted, in this week's list of claims, to Messrs. Titus & Fenwick, is for a very novel purpose. Its object is to control runaway horses, and consists in governing a horse by exerting sufficient pressure upon his nostrils, to check respiration and thereby bring him to a stand-still. The pressure is exerted by means of two ornamental padded levers arranged on the sides of the horse's nostrils, and supported by the bit bar and operated, through the agency of the reins, by the rider or driver. Springs are also provided for throwing the pads off the horse's nostrils when his speed has been slackened, these springs also serving to keep the pads out of operation when only the ordinary strain is exerted upon the bit, and thus render the contrivance capable of serving as an ordinary bit when the horse moves gently.

Improvement in Hand Trucks.

The annexed figures represent the improved hand truck for which a patent was granted to Parley Hutchins, formerly of Norwich, but now of Chester Village, Mass., on the 16th of last month.

The nature of the invention consists in furnishing the truck with an elevator, of which the front piece which raises and supports the load forms a part, the said elevator working in suitable guides in the side pieces of the truck, and connected with a windlass, for the purpose of raising the load to deposit it upon a cart, or any place elevated above the ground.

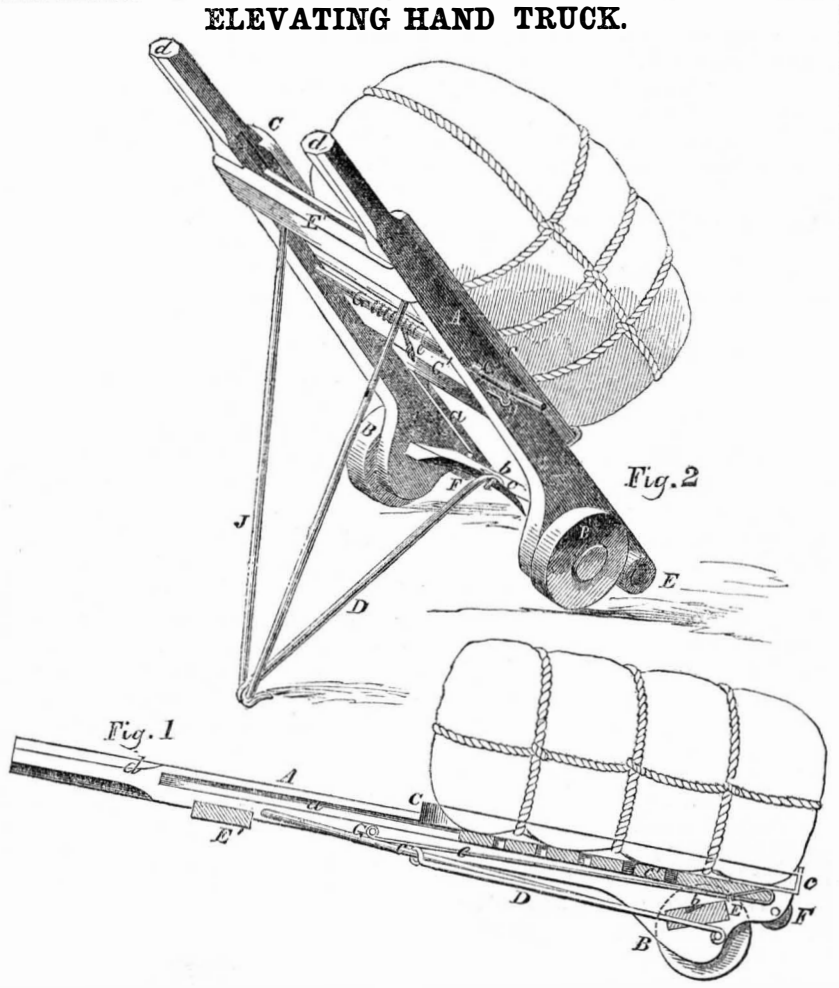
Figure 1 is a longitudinal sectional view of the truck in a condition for moving a load from one place to another; figure 2 is a perspective view of the same in condition for elevating the load. Similar letters refer to like parts.

A A are the side pieces of the truck, of which the handles, *d d*, form a part. These are united by cross pieces, E E', and furnished with a pair of wheels, B B. Thus far this truck resembles the common hand truck without a front piece. The elevator consists of a strong frame composed of side pieces, C C, and cross pieces, C' C', and having attached to its front the iron front piece, C^2, such as is attached to the side pieces, A A, of the common hand truck. This frame rests on the top of the side pieces, A A, and is furnished with tongues on its sides to fit in grooves, *a a*, in the said side pieces, A A, so that it is confined to the main portion of the truck, but free to slide up and down; G is the windlass shaft or barrel working in bearings in the side pieces, A A, outside of which it is provided at one end with a crank, G'. The elevator is attached to this windlass by a cord, *e*; J is a leg attached to the back or under side of the side pieces, A A, to support the truck while raising the load upon it by the elevator. This leg, when in use, is braced by a brace, D, at the bottom, which hooks with a hook, *c*, into a notch, *b*, in the cross-piece, E, as shown in figure 2, but when not in use the brace hooks on to one side of it, and it is thrown up close to the underside of the truck. The truck is provided with a pair of small wheels, F F, in front of the wheels, B B, for the purpose of raising the truck with its load on to a pair of scales to be weighed, or raising it up a step.

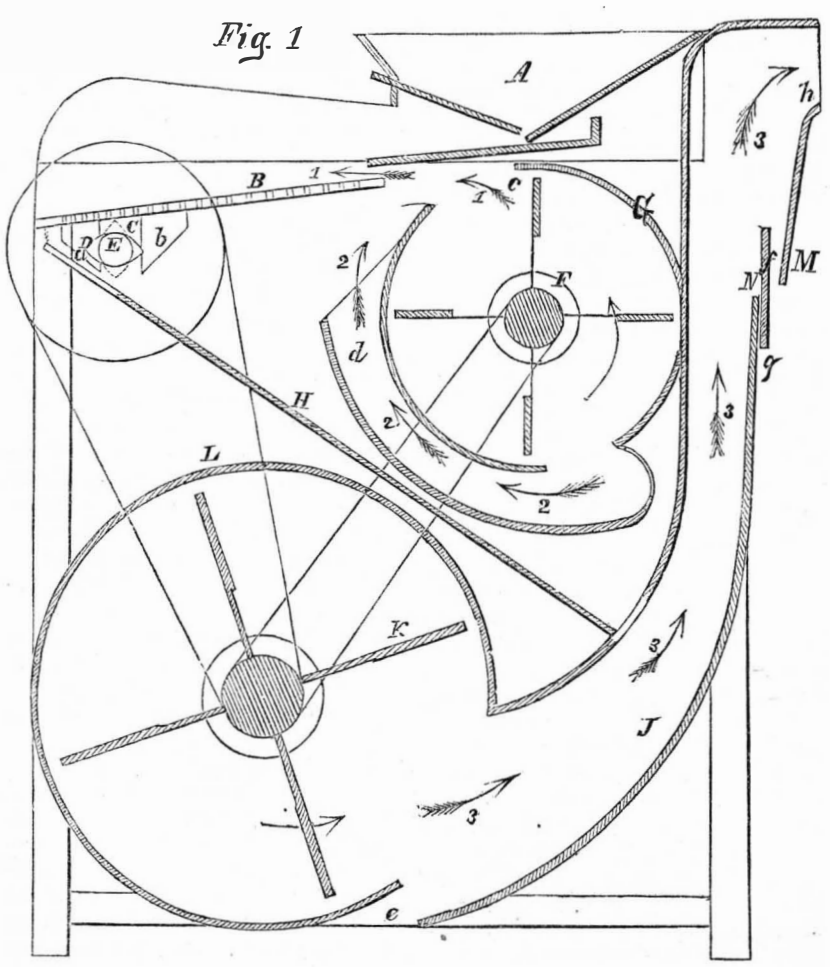
The load is brought on to the truck in the same way as on a common truck, the elevator being for that purpose let down to its lowest position in order that the front piece C^2, may be got under the load, and the leg, J, is thrown up close to the under side. The elevator remains in this position while the load is being moved, as shown in figure 1, but when the load is to be lifted, it is brought close to where it is to be deposited, and the handles are then raised to throw the weight on the small wheels, F F. The leg, J, is thrown down on to the ground or floor, and the brace, D, is brought into operation, when the truck will stand firm by itself, and leave the person using it at liberty to turn the crank, G, of the windlass, to wind up the cord, *e*, and raise the elevator with the load upon it as shown in figure 2. The crank is then prevented turning by a pin, *g*, inserted in the side piece as a stop; and the load is deposited on the cart, shelf, or other elevated place, by merely bringing forward the handles of the truck and dumping it off the truck.

More information may be obtained by letter addressed to the patentee.

ELEVATING HAND TRUCK.



IMPROVED GRAIN SEPARATOR.



The annexed engraving is a longitudinal vertical section through the center of an improved grain separator, for which a patent was granted to David S. Mackey and Jarvis R. Smith, of Batavia, N. Y., on the 25th of October, 1853.

The nature of the invention consists of two parts, 1st, the peculiar manner of operating the screw by means of two eccentrics working between blocks attached to the under side of the screen. 2nd, in having two blasts proceed from a single fan, said blasts crossing each other and so arranged that the grain is subjected to one of them before passing through the screen, while the other prevents the screen from being clogged with chaff, &c.

A represents the hopper in which the grain is placed; B the screen on which the grain falls from the hopper. The screen is sufficiently coarse to allow the grain to pass through it, but will prevent coarser matters; these fall off the screen at its outer and depressed end, it being somewhat inclined. The screen has a vibrating motion communicated to it, by means of two eccentrics, C and D, which are placed on a shaft, E, underneath the front end. These two eccentrics work between two blocks, *a b*, attached to the underside of the screen, and are of an elliptical form, and each one acts against a block, the one, C, working against the block, *a*, and the one, D, against the block, *b*. The eccentric, C, when it acts against the block, *a*, throws the screen forward, and the one, D, when it acts against the block, *b*, throws the screen backward. Now, as the eccentrics are placed in a reverse manner upon the shaft, E, the screen will have a reciprocating motion communicated to it. F is a fan placed in a box G. The box and fan are placed underneath the back part of the screen, or screen frame. The box, G, is provided with two apertures, *c d*, the aperture, *c* being at the upper part of the box, and the aperture, *d*, at the lower part. This box is of an irregular circular shape, so that two blasts may be obtained from the same fan. The fan rotates to the left, and the arrow, 1, shows the direction of the upper blast, and the arrows, 2, the direction of the lower blast. The upper blast passes over the top of the screen, and carries off the chaff and other light particles; while the lower blast passes upward through the screen, and prevents the chaff from settling upon the screen, and thereby prevents the said screen from being clogged. The two blasts, therefore, cross or intersect each other. The grain, after passing through the screen, falls upon the inclined plane, H, which forms the bottom of the box, I, which incloses the fan box. This inclined bottom or plane, H, conveys the grain into a blast spout, J, at the lower end of which is placed a fan, K, inclosed in a suitable box, L. The fan, K, rotates to the left, and the arrows, 3, show the direction of the blast. The grain passes down the blast spout, J, the blast forcing all light matter upward and out of the upper end of the blast spout. In the upper part of this spout there is a partition, *f*, the lower end of which does not quite touch the outer side of the spout, but leaves a small passage, as seen at *g*. The outer side of the spout is provided with a small valve, *h*, by which the opening, N, between the partition, *f*, and outer side of the spout may be made larger or smaller, as desired. The light screenings which possess too much gravity to be blown out at the end of the spout, J, fall through the passage, M, upon the floor, while the heavier screenings fall into the opening, N, and pass through the passage, *g*, into the blast spout, and are thus subjected a second time to the blast. By regulating the valve, *h*, all but the heavier screenings are prevented from entering the passage, N. At the upper end of the apron, H, there is a cockle screen attached by straps to the upper sieve, which thus gets the same shaking motion.

Thus by this improvement the grain is perfectly separated, the screen prevented from clogging, and a reciprocating motion is given to it by an extremely simple device, attended with very little friction.

The operation of this machine has given great satisfaction, both on account of its simplicity and excellent working qualities.

More information respecting this machine may be obtained by letter addressed to the patentees, at Batavia, Genesee Co., N. Y.

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Scientific American.

NEW YORK, FRBRUARY 24, 1855.

Improvements in Steam Navigation.

During the past week, we have been led to examine a new system of steam propulsion, devised by Capt. H. Whittaker, of Buffalo, N. Y., which is at once bold and original. It consists in applying one or more screw propellers to both sides of vessels, and driving them with short stroke, high pressure engines, with direct application to the cranks on the shafts of the screws. The models which we examined were mounted with locomotive cylinders, set inclined, and transversely to the length of the propeller shafts, to which their rods were connected by straps exactly as those of locomotives are connected to their driving wheels. By employing strong and capacious cylinders of short stroke, and connecting their piston rods directly to the cranks of the propeller shafts, a high velocity can thus be obtained,without intermediate gearing. Two or more cylinders may be yoked to one propeller shaft, and the number of engines and propellers (three or four sometimes on one side) are designed to be increased according to the size of the vessel. The plan is simply the applying to steam propellers in water, the same principle that is now employed on railroads. No one will dispute the simplicity of the method over that of the complex and massive marine engines in common use. That the machinery can be made strong and solid enough to accomplish the object, no one will dispute. Capt. Whittaker also designs to exhaust his steam into a large fresh water tank in the lower part of the vessel, which will thus be converted into a huge surface condenser. The object sought to be accomplished by this, is to use fresh water for ocean navigation, and to save as much heat as possible ; there is, no doubt, a great loss of heat in common marine boilers, caused by repeated blowing out of the brine water, also by scale accumulating on the plates.—Any safe plan for obviating such losses deserves attention. Capt. Whittaker is an old and experienced commander on our upper lakes, and during the past year his improvements have been applied, on Lake Erie, to the steamboat *Baltic*, which had run for six years previously with paddle wheels. The old engines were taken out, and two short stroke, high pressure engines put in, and the screw propellers placed where the paddle wheels had been—the shafts and upper lobes of the propellers being above the water.—This new plan of propulsion enabled the *Baltic* to carry two hundred tuns more cargo, and to run with an increased speed of four miles an hour, and all this with a great saving of fuel. As the only way of proving the economy of any invention is by fair and continued trials, here we have this new plan of steam propulsion already submitted to this test,and with success. It has always appeared to us that the stern of a vessel was the wrong place for the screw. No good reason can be given why it should be placed there any more than a paddle wheel, and we cannot but believe, that a screw placed on each side of a vessel, with the same power applied, will propel a vessel with greater steadiness, and much faster than with one screw in the stern,—the common method of serew propulsion. We are aware that it is no new proposition to apply screw propellers to the sides of vessels, but this in combination with the method of driving them, as has been done by Capt. Whittaker, is original. It would be a strange thing if a revolution in ocean propulsion were effected by our inland navigators. We understand that semi-submerged propellers, on account of their economy and speed, have driven off, within the past four years, nearly all the paddle wheel steamers from our upper lakes. This is something which should arrest the attention of our marine engineers, and they should investigate the causes.

We are among the number of those who believe that we are far from having arrived at perfection in steam navigation, and this new plan, we must say, has made a favorable impression on our mind. We, however, dislike the noisy, puffing, high pressure engine, on a steamboat, and have a partiality for the low pressure condensing engine for ocean navigation. The simplicity of the former, however, as applied by this new method of steam navigation, has much to recommend it, and we would really like to see it, as proposed, applied to some of our steamships.

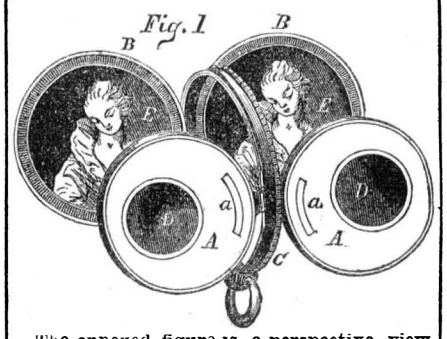
Combustion and Fires.

The fire which burns in a grate or stove, and which spreads its cheerful and life-sustaining warmth around, affords a subject for deep reflection and scientific study.—It has been said by one philosopher that "a knowledge of fire—to generate and maintain it—makes all the differencc between man and brute." This thesis, curious though it be, contains a great deal of truth. Just let us ask the question, "what would man be without fire?" and we will at once perceive in searching for an answer, that it lies at the foundation of all art. Without it there would be no instruments forged, consequently no houses built, and man would be no better off than the wild beast of the jungle. With fire, metals are smelted, and instruments for agriculture, architecture, and the arts fabricated, and upon these are based all that is useful and ornamental in physical science. And what is fire? Simple though the question is, it is not so easy to answer it, and like all other propositions in philosophy, we must be content to describe its *operations*, for that is all which we call *laws*. Fire or combustion is produced by a change of state, or condition of two or more bodies, during which period heat is produced by the substances undergoing change. There are three kinds of combustion, viz., instantaneous, high, and low. The former is witnessed in explosions; the second in common fires, and the third in the human body, the oxydation of metals, &c. Everything capable of combining with oxygen is called combustible, and according to the rapidity with which it combines with oxygen, so is the combustion quick or slow. Common gas which we use in cities, burns with a high heat, but not very fast, and will not explode when a light is applied to it, but if a certain quantity of it be mixed with seven times its volume of the atmosphere, it will explode instantaneously when touched with a match. In gunpowder we have the same elements as gas—for instantaneous combustion—but in a solid state. Iron, when rusting,—oxydizing—developes heat, but this is not noticed, the action being slow, and the heat dissipated as fast as it is formed. But if *pure* iron be reduced to fine powder, and thrown into the atmosphere, it will fall down in sparks and burn at a glowing heat. If it were not for this quality of iron—its readiness to combine with oxygen, and thus burn slowly away, by the action called rusting—it would be more valuable in the arts. It is no doubt the most valuable of all metals as it is, but could it be improved as not to rust and still maintain its qualities of forging and tempering, its value would be greatly enhanced. The amount of heat produced in any body by combustion, depends on the relative quantity of oxygen absorbed in a given time. Boiled linseed oil absorbs oxygen with great rapidity—about eight times its bulk in twelve hours, hence articles saturated with this oil are liable to spontaneous combustion. A substance which, by its nature, is known to be combustible, that is, has a great affinity for oxygen, combines with it fast or slow according to the heat of one or both of the substances. Thus with anthracite coal, although it is a combustible substance, it will not produce combustion in contact with oxygen until it is exposed to a high heat, and every person knows that the higher the heat to which it is exposed, so much more rapidly does combustion go on. Ships containing bituminous coal have been consumed by spontaneous combustion in warm climates, but seldom, if ever, in cold. Cotton waste, saturated with boiled oil, will undergo spontaneous combustion at 120°, in about forty minutes, and from this cause, many factories have taken fire. Wood, in contact with hot water pipes, at 160°, has taken fire. Watchfulness against fires, therefore, is more imperative in warm than in cold apartments. A difference between 50° and 110°, trebles the tendency of painters' oil to ignite spontaneously. A piece of phosphorus, if placed on a plate of iron, will oxydize, without burning, because the iron conveys the heat away as fast as it is formed, while on the other hand, if it be put among some cotton wool, it will very soon ignite, because the cotton does not dissipate, but accumulates the heat, and produces an increasingly energetic action.

For spontaneous combustion, the following conditions are necessary:—1. A substance capable of uniting with oxygen with considerable vivacity, (or others capable of uniting together.) 2. A supply of oxygen. 3. A comparatively large absorbing surface. 4. Sufficient mass to prevent the heat formed from being readily dissipated ; or a constantly sustained heat from 70° to 212°. The various things known to be liable to spontaneous combustion are sulphur and iron, iron pyrites, coal which contains the above, carbon, when in powder and mass, whether lampblack or bituminous coal, especially when heated and moist. Compounds of phosphorus, lucifer matches, sawdust moistened and heated, all oils, and things in which oil is much used, seeds containing much oil are all liable to ignite.

It is our opinion that many fires take place in our cities every winter from a want of knowledge relating to combustion. We hope this information may be the means of preventing their frequency.

Stereoscopic Medallion.



The annexed figure is a perspective view of a very neat and ingenious application of the stereoscope to daguerreotype medallions. A patent for this improvement was granted on the 16th of last month, to J. F. Mascher, of Phila.—who is well known to the readers of the Scientific American—for a number of useful inventions. C is the main central rim of a locket; B B are two lids with daguerreotype pictures, E E, on them ; these lids are hinged on each side of the rim, C. A A are two supplementary lids, each containing a lens, D D. These are also hinged to rim C, as shown, but are fitted to fold within the picture lids, B B, and are arranged in such relation to the same, that upon being opened and properly adjusted, the lenses, D D, will stand opposite to the pictures, and convert the medallion into a stereoscope, by which a person looking through the glasses, D D, will see but one picture, solid and life-like. The patentee has applied double convex lenses to these medallions—the sides of which are of unequal convexity (as one to six)—according to Brewster, so that the picture is rendered very clear. A medallion of this character can be used for a microscope and sun glass, and thus it can be carried around in the pocket, both as an ornamental and useful memento of affection.

More information may be obtained by letter addressed to J. F. Mascher, No. 408 North Second street, Philadelphia, Pa.

Manufacture of Stone.

We have seen during the last week a very fine sample of artificial stone, of an ornamental character, manufactured on Coney Island, near this city. The stone is made of sand clay, and common salt, cheap materials, and found in great abundance and purity where the factory has been established. The manufacture is the subject of a patent granted to J. Hornig & L. Seuss, on June 7th, 1853, the claims of which will be found on page 318, Vol. 8, Scientific American. Mr. Seuss, who showed to us the sample of artificial stone, stated that it had been tested by exposure to the atmosphere, in water, and to a crushing force, and had stood all these tests well. It has not only all the appearance of fine sand stone, but it is in reality such, and it appears to us that for ornamental architecture, it must come into extensive use, as it can be manufactured much cheaper than rock stone can be cut.

A Scientific Error Corrected.

In all recent works on comparative physiology, the dogma has been propagated that existing osseous fishes have heterocercal tails in their embryonic state (tails with the upper lobe longer than the lower one while young) which disappear as they are matured, their tails becoming homocercal—that is, the upper and lower lobe of the tail equally developed, the earlier fishes being heterocercal. Agassiz has pointed it out as a law, that the modern fishes, at one part of their existence, are heterocercal, but change in their mature state to the homocercal. This dogma has been seized upon by the developement theorists, and used with some effect. In the last number of the *Westminster Review*, the fallacy of this dogma is pointed out, and Agassiz is severely criticised for carelessness. It is there stated that this theory was adopted from the memoir of M. Vogt—a German physiologist—on the developement of one of the salmon tribe. He, along with Agassiz, jumped to the conclusion without an examination, that all homocercal fishes were developed like the salmon. The reviewer asserts that the anatomical structure of the tail of the perch and mackerel—homocercal fishes—is not the same as the salmonoid tribes, but that they are homocercal from the first, and always remain so. The reviewer also asserts, that the heterocercal tail in fishes is an advance in developement, therefore, as the earlier fishes have heterocercal tails, the argument is a strong one against the progressionists, who insist that the homocercal tail is a developement of the heterocercal.

The Polytechnic Journal Gone.

In thelast number of the above named Journal, the editor, J. J. Greenough, Esq., informs his patrons that it will be no longer published. This Journal was commenced two years ago in this city, by J. J. Greenough, Dr. C. G. Page, and C. L. Fleischman. High hopes were entertained of its success when first published. Mr. Fleischman is now in Paris, Dr. Page in Washington, and Mr. Greenough has concluded to stop its publication. It is a very difficult task to manage and conduct a periodical devoted to science and the arts. The *Polytechnic Journal* contained much useful information, and we regret to see its light so early extinguished.

Electro-Plating Applied to Cutlery.

The improvements which have been made in the art of electrotyping, and the diversity of purposes to which it is now applied, almost surpass belief. It is used to make plates for printing bank notes, maps, common printing cuts, and type; also plated ware and many other things. One of the most useful applications that we have seen of it lately, is its application to table cutlery, by Joseph Hill, Electro-plater, No. 159 Atlantic street, Brooklyn. The utility of silver plating table cutlery, is the prevention of rust; the articles afterwards never requiring to be scoured, and have only to be wiped dry with a towel or buckskin after use, and always look bright and clear. We understand that a number of the leading hotels of our city have had their cutlery electro-plated, and have effected a great saving thereby.

Muntz Metal Tubes in Boilers.

In the last number of the London *Artisan*, a correspondent who had read R. Armstrong's letter on Muntz metal for bolts and sheathing, directs attention to their extensive use in steam boiler tubing. He confirms the statements respecting the brittleness of the brass bolts and sheathing.

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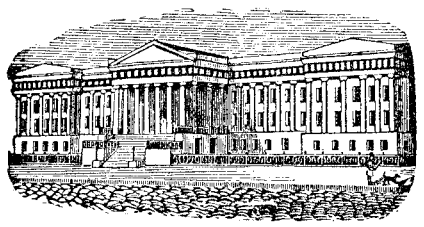

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from he United States Patent Office.

FOR THE WEEK ENDING FEBRUARY 13, 1855.

CLOVER HULLERS—James Allen, of Trease's Store, Ohio: I do not claim adjustable tail-boards, in separators, nor inclined guide boards for receiving and conducting the seeds to their receptacle; nor do I claim a tailing screen, except under an arrangement like that set forth.

But I claim the arrangement of the two tail-boards, d d, in combination with the tailing screen, L, so arranged under the inclined boards, K, that it shall be out of the way of the blast and yet deliver the seed at M, into the main receptacle, and the tailings out at its side through the aperture, b, it being understood that the outer and inner tail-boards must be adjusted, respectively, with reference to the screens, I and J, all as set forth.

MACHINES FOR CHOPPING MEAT AND OTHER SUBSTANCES—Wm. H. Allen, of Lowell, Mass.: I do not claim the use of chopping knives on vertical sliding heads playing upon a block or receptacle. Nor do I claim the cam acting upon a circulaa corrugated disk as a means of combining the lifting motion with a gradual rotary one, this having been done before in machines for drilling rocks.

But I claim the forming a machine for chopping meat and other similar substances, by attaching the chopping knives, H H H H, to a central rotary spindle, F, when this is operated by the combination of the cam, M, and corrugated disk, as described.

HOP FRAMES—T. D. Aylsworth, of Frankfort, N. Y.: I do not claim the training of hop or other vines on wires or cords, as this has been done before.

But I claim, in combination with the permanently arranged supporting cord or wire, C, the training cords or wires, D, leading from the ground to said supporting wire and connected thereto by a spring hook, or its equivalent, so as to be readily connected to or detached from the supporting wire, for the purpose and in the manner set forth.

I also clai m in combination with the training cord, D, the inverted cup, d, for turning down the top of the wire, and preventing it from entering the supporting wire, substantially as set forth.

LIFE BOAT—Hiram Berdan, of New York City: I do not claim of themselves either the hinged or pivoted ribs, or the hinged gunwale bars.

But I claim the method described of keeping the gunwale bars, E E, in place when the boat is extended for service by means of the notches, e e, which are made in the ribs, F F, to receive the said gunwale bars.

COTTON GINS—Henry Clark, of Newport, Fla.: I do not claim simply rollers for ginning cotton; nor do I claim the spiral grooved roller for that purpose, as it is contemplated to use the large roller without any groove; nor do I claim the comb simply.

But I claim the combtnation of a large ginning roller, either smooth or grooved, with a very small one, the latter driven and supported, as described, by the friction rollers and the large ginning roller, together with one or more stripping rollers and comb, for the purpose of removing cotton seed from the fiber, substantially as arranged and described.

CHURNS—E. B. Clement, of Barnet, Vt.: I claim the folding dasher, operating as set forth.

THRASHERS AND CLEANERS OF GRAIN—George Daniels, of Philadelphia, Pa.: I do not claim a skeleton cylinder, nor inclined planes, nor a blower case containing a fan attached to thrashers and cleaners, irrespective of the peculiar construction of each, as described; nor do I claim placing a fan upon the shaft of a beating cylinder, as this combination has been known and used before.

But I claim, first, a skeleton cylinder in combination with a cast iron bed plate, constructed as, and for the purposes specified.

Second, I claim the four inclined planes, G, placed in relation to each other, as described, each at an angle of about 45 degs., as described, and so as to leave an oblong opening between them for the passage of the grain and chaff to the receiving box, substantially as and for the purposes described.

Third, I claim the blower case, B, the receiving box, C, with its inclined plane, f, at its end, arranged and combined on the outside of the box, or body of the machine, substantially as and for the purpose specified.

STAYS FOR ARTICLES OF DRESS—John Dick, of New York City: I claim the described improvement in stays, as applied to articles of wearing apparel, consisting of two or more supporting pieces with a spring or springs applied to extend them, substantially as set forth.

WHARF BOATS—H. T. Dexter, of Zanesville, Ohio: I claim so constructing a wharf boat, so that a turn-able may be conveniently located therein, upon which a dray may be driven and turned around, and so that freight may be delivered or received from any part of the boat without much handling, substantially as described.

PLOWS—George Esterly, of Heart Prairie, Wis.: I am aware that a standard has been cast with wings to support the shares and mold board.

But I claim casting the standard, G, with raised portions, A, land side, H, and form lay, K, all in one piece, to be employed either with or without projection B, as set forth.

SMOKE CONSUMING STOVE—James Easterly, of Albany, N. Y.: I do not claim the use of a fuel magazine, nor of a downward draft for the fire, neither being novel arrangements in stoves.

But I claim the constructing a stove, as described, with openings for the admission of air to the burning fuel, at some point or points above the grate, including between said points and the grate sufficient fuel for ignition at any one time.

CRACKER MACHINES—Phineas Emmons, of New York City: I claim the revolving intermittent bed plates, operated by means of an eccentric on a driving shaft, and the connecting rod, lever, pawls, and notched wheel, in combination; and this I claim, whether the said intermittent bed plate be or be not combined with the endless barrel surrounding it, for the purpose of conveying away the crackers, substantially as set forth, it being understood that I do not claim, in general, the making of the machine, so as to convey the dough beneath the cutters, with an intermittent motion, that having been before done in other machines by passing the dough upon an endless band carried with an intermittent motion over a fixed table upon which the cutters work.

SPIRIT LEVELS—Hampton W. Evans, of Philadelphia, Pa. I do not claim the disk plate or conic center upon which it revolves, as new; but in connection therewith I claim the crescen -shaped sliding or adjustable stops, and spring catch, in combination with the grooved disk and set screws or their mechanical equivalents, the whole being arranged and constructed in the manner and for the purpose described.

STEAM BOILER CHIMNEYS—Asahel Fairchild, of Ashland, Ohio: I claim connecting the chimney of a steam boiler furnace to the flue connecting breeching thereof, by means of a cylindrical joint arranged in such a manner that the chimney can be lowered into a horizontal position without producing openings in said joint, and also without closing the connection between the chimney and the furnace flues, substantially as set forth.

MACHINERY FOR FELTING HAT BODIES—Wm. Fuzzard, of Newark, N. J.: I do not claim the corrugated rollers, C C', separately, for they have been previously used, although differently arranged from those described.

But I claim the employment or use of the corrugated rollers, C C', placed in a swinging frame, B, in combination with the endless apron, G, the above parts constructed, arranged, and operating in the manner and as shown and described.

ROTARY PLOWS—J. W. Haggard & Geo. Bull, of Bloomington, Ill.: We claim the arrangement and combined operation of the plows, I I I I, cutters, J J J J, and semicircular way, K, substantially as and for the purposes described.

WEATHER STRIPS FOR DOORS—Alonzo Hitchcock, of Chicago, Ill.: I do not claim the V-shaped groove, nor the hinged weather strip, nor the listing, as described, as they have been used before.

But I claim the peculiar form of the elevated surface or plane, E, in combination with the V-shaped groove, weather strip, and listing, substantially as set forth.

SEWING MACHINES—G. H. & B. H. Horn, of Brooklyn, N. Y.: We are aware that sewing has been effected by two threads, the one being carried by a shuttle, the other by the needle; therefore we do not claim the same, and we are aware that the stitch has been pulled tight by the motion of the needle and needle carrier.

And we do not claim the shuttle, but we are not aware that forceps have ever been used to pass through the loop of thread, and open the same, thereby insuring the opening of the loop and preventing tangling; nor do we know that the shuttle has been drawn through a loop by means of an eye on the end, thereby avoiding all liability of the shuttle not passing into the loop, and where the shuttle is forced through the loop as the needle draws up, its thread has to pass between the rear end of the shuttle, and the part has forced the shuttle forward, which is liable to break the thread.

We claim, first, a hollow needle with an eye in the side to pass the thread, as specified.

Second, we claim opening the loop by means of forceps, thereby insuring that the loop is properly opened and avoiding tangling of the thread, as specified.

Third, we claim drawing the shuttle through the loop by means of the eye, o, or its equivalent on the end of said shuttle, as specified, thereby avoiding the risk of breaking the loop when the shuttle is forced through the same, as specified.

SHIPS' STANDING RIGGING—Frederic Howes, of Yarmouth Port, Mass.: I claim forming the shroud and back stays or other standing rigging in one continuous piece, and conducting the rope of which they are formed, alternately, through proper guides aloft and guides at the channels or chain plates, as set forth.

METHOD OF TEACHING PENMANSHIP—Wm. S. MacLaurin, of New York City: I claim the employmena of figures such as described, marked on or formed in the surface of a tablet, slate or other surface, for the purpose of aiding the hand in guiding the point of a pen, pencil, or stylus, in retracing therewith the lines of the said figures an indefinite number of times, as described, to train the hands of pupils in teaching them the art of writing.

LEATHER SPLITTING MACHINES—M. H. Merriam, of Chelsea, Mass., and J. B. Crosby, of Stoneham, Mass.: We claim, first, the disk cutter having a simultaneous rotary and reciprocating movement as applied to machines for splitting leather and other analogous purposes.

Second, we do not claim the broad device of constructing a draft roller, so that it shall have a greater circumferential velocity in one part than in another.

But we claim constructing the draft roller, o, so that its increased circumferential velocity may be made to act more or less efficient, as desired, substantially in the manner described.

Third, the combination of the apron, L, bed, K, and draft rollers, i and o, when the roller, o is constructed substantially in the manner and for the purpose set forth.

GRASS HARVESTERS—Robert J. Morrison, of Richmond, Va., Assignor to himself and Edwin A. Morrison, of Lawrenceville, Va.: I claim constructing the cutter teeth or blade and teeth, and the guard fingers, of three several plates of metal, all of similar form, and lying closely upon each other, the middle row of teeth being sharpened and stationary, while the upper and lower ones are vibrated for the purpose of causing whatever slipping there may be in gathering in the stalks to be cut, to come upon the fingers mainly, and thus protect the sharp edges of the cutters, as set forth.

LAMP EXTINGUISHERS—Josiah H. Noyes, of Abington, Mass.: I claim attaching the caps or extinguishers to the wick tubes of a lamp by means of rods secured to the said wick tubes, and in such a manner that the caps may be freely moved up and down the said rods, and applied to or removed from the top of the wick tubes, as set forth.

MACHINES FOR SLAUGHTERING HOGS—Jefferson Parker, of Louisville, Ky.: I claim the arrangement of the elevating fingers, d d, and the chains, e e, with the operating levers, and with the scalding vessel, A, and the scraping bench, B, substantially in the manner and for the purpose set forth.

GARDEN RAKES—S. N. & W. F. Stillman, of Leonardville, N. Y.: We claim the new manufacture of garden rake described, viz.: a rake having curved metal teeth inserted and fastened into the head as set forth.

BRIDLE BITS—Wm. D. Titus, & Robert W. Fenwick, of Brooklyn, N. Y.: We claim the described improvement in bits for stopping runaway horses, consisting in the application of padsso arranged and controlled by a rein, that, at the pleasure of the rider or driver, they may be made to close the horse's nostrils, and thereby check respiration, as set forth.

PLOWS—Ira Reynolds, of Republic, Ohio: I am aware that plow points have been constructed with oblique shoulders, a corner of which was made to bear somewhat like the shoulders in my plow point.

But I claim, first, the laterally extending shoulder, r' r', drawn back against and somewhat between the two shoulders, r r, in order to hold the point securely in place, and prevent the breaking of the shank, t, near the shoulder, in the operation of plowing, substantially as set forth.

Second, I claim the arrangement of the within described reversible steel share, as secured to the face of the mold board by means of a screw bolt inserted from the lower side of the female screw being formed in the steel share, as set forth.

Third, I claim the reversible self-fastening colter. constructed, secured, and arranged in manner and for the purposes set forth.

STEAM VALVES—John Tremper, of Philadelphia, Pa.: First, I claim the valve composed of a ring without ports or passages in its sides, applied substantially as described, within a casing containing a fixed head or cup, b, and a passage or passages, d, leading from one side to the other of the said fixed head or cup.

Second, The guard ring, C, applied substantially as described, either with or without the lip, i, for the purpose of protecting the inlet side or end of the valve against the percussive effect of the rush of steam, or other fluid, at the commencement of the stroke of the engine.

HEAD SUPPORTERS FOR RAILROAD CARS—J. N. Williams, of Dubuque, Iowa: I claim the arrangement of head supporters in railroad cars in such a manner that each pair of supporters, by reversing their positions, can be adapted equally well to either one of the two seats nearest the said supporters, when the said seat has the rear side of its back turned towards the supporters, substantially as set forth.

I also claim the combination of the head supporters, c c, the plate, b, the bar, a, and the cord, f, or their equivalents, in such a manner that the supporters can be placed in the proper position for supporting the heads of persons riding on either one of the two seats nearest to said supporters, or turned up and secured to the side of a car, substantially as set forth.

The Way to Build up a State.

Governor Grimes, of Iowa, in his inaugural address, thus describes the wants of the thriving State over which he presides:

"She wants educated farmers and mechanics, engineers, architects, metallurgists, and geologists. She needs men engaged in the practical duties of life, who have conquered their professions, and who are able to impart their knowledge to others. She wants farmers who shall be familiar with the principles of chemistry as applied to agriculture; architects and mechanics who will adorn her with edifices worthy of so fair a land; and engineers and geologists who will develope her resources, and thus augment the wealth and happiness of her citizens. This want can only be supplied by the establishment of a school of applied sciences. I have no hesitation, therefore, in recommending that a university fund be appropriated to establish a practical scientific or polytechnic school."

New Petrified Bodies.

The Dayton (Ohio) *Empire*, gives an account of some bodies which were buried some years ago, near that city, having become petrifications. The bodies were the wife and grandchild of G. P. Loy, and were buried on a little knoll on his farm in the Miami Valley. He opened their graves to remove them to his family lot in a new cemetery, when, on coming to the coffin of his first wife, who had been buried twenty-four years before, it was found to be perfect in form, but could not be raised on account of its great weight. It was at last lifted by six men, when its lid was removed, and the body appeared to be perfect. Upon a close examination it was found that the remains would not give way under the pressure of a piece of board which one of the gentlemen placed upon the corpse, and this strange circumstance led to still further investigation.

The shroud, and indeed all the covering which was upon the body at the time of interment, 24 years ago, had disappeared—not a vestige of them remained. The body was perfect, except the right leg, from the knee to the ankle joint, where the flesh seemed to have wasted away, and lay at the bottom of the coffin, in a substance resembling sand. With this exception of decay, the body and limbs exhibited the same perfectness of exterior they did when in life.

The body had become petrified! It was by some quality of the earth turned into stone of a drab, or, more properly speaking, flesh color.

The grave of the grandchild of Mr. Loy was next entered, and the coffin exhumed. It was also found to be heavy, and when opened the corpse presented much the same appearance as that of Mrs. Loy. It was not as perfect, however, although petrified. The most remarkable thing connected with the remains of the child was, that the hair upon the petrified skull was to all appearance the same as life! The other bodies which were exhumed—one or two in number—were only partially petrified.

There is a petrifaction—that of an Indian—in the British Museum, taken from the Island of Guadaloupe, and said to be the oldest of a human being in the world. In the work of Gliddon and Newton, on the diversity of the human race, this Guadaloupe petrification is spoken of as a most wonderful curiosity, and affording evidence of the great length of time—more than forty thousand years—that the human race has lived upon our continent,—the great length of time required to form the petrification being alleged as a reason for this conclusion, but the facts now brought to light in Ohio shows upon what very slender data they have formed their opinions. It appears to us that we have read of bodies having been found petrified, in other places, a few years after interment, but we cannot lay our hands upon the source of information at present.

How the World was Made.

MESSRS. EDITORS—I would like the privilege of a few remarks on an article headed "Age of the World," on page 165, in which you review an able effort of Rev. John O. Means, to reconcile the Genesis' account of creation with the science of geology, &c. The Reverend gentlemen reasons well, no doubt, but I apprehend, from wrong premises. There seems to be greater difficulties in the way than the length of days, or "periods," and the supply of light. If the earth were created, as he maintains, three long periods before the sun, moon, and stars, the question arises, "did it revolve or remain stationary?" If it revolved, according to the philosophy of motion, it must have flown off in a straight line; if it remained stationary, I can see no other alternative but the "turtle's back" to support it. If reason and philosophy are to be our guides in speculating on these questions, we should apply them thoroughly to every theory or hypothesis, whether physical or metaphysical, and if they do not coincide with this test, they should be received as of very doubtful reliability. It seems to me, therefore, that it is not in keeping with reason and philosophy, to suppose the creation and consequent action of the minor (our earth) before the major and central body (the sun.) Surely the earth is not the principal body for which these great and magnificent systems, which Astronomy reveals to us, were created, and of which our solar system forms but a small part; and then to think our earth forms but an insignificant portion even of that.

In view of these considerations it seems to me contrary to reason, and the laws and philosophy of motion to suppose the earth created before the sun, moon, and stars.

DAVID PALMER.

Batavia, N. Y., Feb. 12, 1855.

[If there were no other planet or body than the earth in the universe, unless it received an impulse, it would neither move off, nor in a straight line, nor require the *turtle's back* to hold it up. Mr. Means is not wrong in his premises here. But as he is a believer in the nebular hypothesis, his conclusions are somewhat contradictory, because it assumes that the matter of which the earth is composed rotated around that of the sun, as a center, with the matter of the moon, planets, and stars, outside. This dogma is positively negative to the sun or the stars being made after the earth. We must also say, as our correspondent has directed our attention to this question, that Mr. Means has endeavored to give a very wrong and unfair exposition of the plain meaning of the word *water*. In the Scriptures, describing the second act of creation, it is stated, "God said let there be a firmament in the midst of the waters, and let it divide the waters from the waters,"—the waters below from the waters above—"and it was so." In reference to this language Mr. Means says, "if the *waters* spoken of were matter in a gaseous state, the separation would be the process by which nebulæ were detached from the mass and formed into worlds. No one can affirm that such was not the character of the *waters*," "the word *water* is not evidence that it was not gaseous matter."

The word *water* used here, he assumes, along with Prof. Guyot, means *gas*—nebula. Now let us take his explanation of the word *water*, and apply it to the third day's acts in Genesis, and see what a wretched exposition he makes of it.

It would read, "Let the gas, or nebula, under the heaven (this gas, be it remembered, is the *water below*, that was separated from the water above) be gathered into one place and let the dry land appear, and it was so; and God called the *dry* land earth, and the gathering together of the gas, or nebula, called He seas." If Mr. Means and Guyot are correct in their way of explaining these descriptions in Genesis, to prove the nebular hypothesis, their logic leads to the absurd scientific conclusion that the moon is a globe of water.

Our correspondent's reasoning with regard to the sun being the major body of the solar system, and could not be created after the earth; and that the latter was not the principal body for which the sun was made—according to the Genesis account, is very natural, but we do not think it profound. Why should not the sun be created for the earth? If the sun contains no living intelligence (and who believes it does) the earth contains far higher and more elevated objects of creation. Man was created after our globe was formed, yet is man not a more noble work of creation than a dead world?

Prizes for Astronomical Discoveries.

At a recent sitting of the Paris Academy of Sciences, the prize for astronomy was divided amongst MM. Luther, belonging to the observatory of Blik, near Dusseldorf; Marth, attached to Bishop's observatory at London; Hind, belonging to the same observatory; Ferguson, attached to the observatory at Washington; Hermann Goldschmidt, historical painter, and Chacornad, attached to the observatory at Paris—each of these persons having discovered a small planet in 1854.

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TO CORRESPONDENTS.

J. S. D., of Tenn.—Your plan for propelling a boat is a very old one, and the question of its economy has long since been exploded by actual trial. Boats have been propelled by sucking water in at the bow and discharging it at the rear; but the screw propeller is far superior to such an arrangement; ouraccount of the Lancaster gun was correct—you will catch a weasel asleep quite as quick as the SCI. AM.

Z. B. P., of Mo.—One dollar received; but as you omit to subscribe your name to your letter, we cannot enter you upon our subscription books; your churn we think may be patentable, but there is some doubt about it.

A. P. B., of Ohio—There is nothing new in the lubricator, which you send a sketch of, in fact it would not have been new if you had invented it forty years ago; the first one we ever saw was precisely like the one your sketch exhibits.

A. C. B., of Ala.—Your specification was forwarded for your signature on the 12th: it is no fault of ours that your case has been completed no earlier; the model did not reach us until the first of this month.

M. & J. G., of Ill.—Suitable engravings to properly illustrate your furnace in the SCI. AM., we should think would cost you about $18. Your Letters Patent we should require to get the views from; they could be sent by mail or express with safety; we never engage in the sale of patent rights.

J. P. H., of Ohio—It is impossible to state the cost of engravings of your machines before seeing Letters Patent or models of them; if you will send your Letters Patent or models we will inform you of the cost of suitable cuts immediately on their receipt.

J. G., of Ind.—There is nothing new in the application of a float to regulate the opening of the supply cock in the feed pipe, and we see nothing patentable in your mode of applying it. Other portions of your letter will be published.

J. R. G., of O.—Your petition of withdrawal, with five dollars, came to hand. The fees being all paid, your application is ready to be forwarded to the Patent Office, on its return to us properly executed.

C. R., of Phila.—A pickle for cleaning brass is made of muriatic acid and water; the brass is washed in warm water whenever it is taken out of the pickle. Brass lacker is made by dissolving one ounce of gamboge, cut small, one pound of fine pale shellac, and three ounces of aloes, and half a pound of turmeric, in two gallons of alcohol. Use a clean tin or glass vessel, and agitate for three days, then strain it through a cloth and bottle for use.

A. B., of Conn.—You can tin the wire very rapidly, we should think; we cannot give you the remedy asked. We have had a number of enquiries about cores like the one you have made; we do not know of a substitute for sand in making them.

J. M., of N. Y.—Copper is eight times a better conductor than iron. Lyons' conductors appear to be good.

G. D., of O—Red lead and iinseed oil make the best paint with which we are acquainted for painting tin roofs.

R. M. B., of Geo.—Neither a pump nor water ram, to throw back the water on your overshot wheel, will be of the least advantage, We have heard of a steam engine being used to pump up water to supply a water wheel. The plan is as sensible as the one proposed to you for using a hydraulic ram and pump for the same purpose.

E. A. H., of Ill.—We have not heard anything more of Mr. Rankins' invention. We assure you it is impossible to form what is known by the name of coke, by the plan you state as practised by blacksmiths. They cake their coals, but coke is produced by depriving coal of its volatile products. In gas works the volatile product is saved, and you may also save it by burning the gas as it is produced.

R. P. M., of N. Y.—A clothes dryer capable of being adjusted as you describe, is not new. The same thing has been in use, and is already secured by patent, we think.

W. H. M., of Ind.—We note your observations in regard to interfering cases. You have a perfect right to contest the question of priority with Mr. B. We are well acquainted with him, and do not think he is capable of a dishonorable transaction in regard to procuring his patent.

G. K. W., of R. I.—We have examined the sketches of your extension table and find it to possess no patentable novelty. We have seen the same thing before, and there is now a patent existing for it, we believe.

C. W. G., of Ct.—Such a wagon brake as you describe is illustrated in No. 41, Vol. 4. No claim can now be made on it.

J. L. H., of N. Y.—There is nothing new in dispensing with the eccentric and driving the valve from the piston rod, but as far as we know, that has always heretofore been performed outside the cylinder by a tappet arm on the piston rod acting on fixed collars on the valve rod. Your method of driving the valve dispenses with valve rod and stuffing box, and in that respect is more simple than the other. We should think it practicable and patentable.

W. A. T., of Ark.—With pasteboard, paste, and needle you might get up a binding suitable for your diggins, No special directions can be given.

J. R. & D. H. W., of Mass.—We are very doubtful about your being able to patent the alleged improvement in straw cutters. We think it would interfere with Gale's, but can not fully decide without a model to examine.

G. B. C., of Ohio—We don't understand your inquiry.

A. G., of Ind.—Your improvement in sewing machines is no doubt a valuable one, and embraces novelty in our opinion. We do not know of any arrangement more simple and effective.

W. C. B., of Ill.—We do not find the model of your endless chain car. Please send us a sketch and description of it, stating what you claim specifically, and we will give it a thorough re-examination.

E T., of Ohio—There is no substitute you can use for coal gas, economically, that we are aware of; these portable apparatuses which are in use, are adapted for small places or country residences, where coal gas cannot be obtained from an incorporated gas company, and not to take the place of our street gas; the Maryland Portable Gas Co. we know nothing about.

J. P., of N. Y.—It will be necessary for you to send us a drawing or model of your machine before we can express an opinion upon it; your description is too vague to convey a proper idea of its construction and operation. $1 credited on account of subscription.

E. A. H., of Mo.—We think the Irving boiler an economical one, and have no reason to suppose it inferior to what those who have used them say of it; why don't you address some of the parties who have used the boiler, and get their opinion of it?

J. A. B., of N. Y.—The instrument patented by Mr. Bates and illustrated in our last volume, or the cure of stammering, we have never had occasion to use, but some who have, recommend it, while perhaps others condemn it; if we were afflicted in that way we think we should try it; the expense cannot be much.

W. F., of N. Y.—You are not obliged to stamp the place of your residence upon your machines at all, unless you choose to, and if so you can stamp them with your name and present place of abode, without regard to where you resided when the patent issued. The use of enamelled keys for pianofortes is not new or patentable.

D. N. D., of Mass.—Catches, instead of balls, have been used in a similar manner to the plan proposed in your sketch. It is not impossible but that a patent might be obtained for you, but it would be doubtful in view of an existing patent so similar, although your plan is preferable.

G. W. F., of Md.—Minifie's Mechanical Drawing Book is a good work for you to study; price $3.

T. A. R., of Pa.—We cannot give you a receipt for coloring hair upon which much reliance can be placed.

C. T., of N. Y.—We do not discover any novelty in your method for regulating the power of marine engines; similar ideas have been suggested to us before.

J. S. M., of Va.—We do not discover any chance for a claim on your "side jointer; it is similar in its operation to a circular saw, and no claim could be made on a vertical cutting disk, as this is already used in planing machines.

J. M., of Ind.—Your letter covering $10 is received, and a re-examination of the case ordered: as soon as any decision is made we will lose no time in apprising you by letter.

D. N. B. C., Jr., of Mass.—We are obliged to you for the drawings you send, showing the different applications your invention is adapted to, but we could not publish them, as they would occupy too much space: the cut of the faucet alone, which will be published next week, will be sufficient to show the merits of your invention.

E. T. S., of Ohio—Your letter, with $5, came duly; Mr. R.'s papers were filed in the Patent Office on the 7th inst.

D. H. W., of Ill.—The question as to which wheel slips, depends upon the radius of the curve. The treads of car wheels are generally bevelled. When a car turns a curve the flange of the outer wheel presses close up against its rail, whereby that portion of the outer wheel which rests upon the rail is of a greater diameter than the portion of the inner wheel which rests upon its rail. This will cause the outer wheel to travel further than the inner, without slip to either—provided the radius of the curve is arranged for that purpose—which is generally the case. When the curve is short, the outer rail elevated, and the velocity of the car low, the weight and friction on the inner wheel is greatest, and the outer wheel slides; if the speed is sufficiently high the weight and friction on the outer wheel is increased beyond that of the inner wheel, and the inner wheel slips—or, in other words, turns faster than the space over which it passes requires.

G. B., of Wis.—Your automatic cut-off is new to us, and we should think patentable. It is difficult to give an opinion of the degree of success that might attend the practical operation of any invention of this character, but we see no reason why it should not work well. We do not remember having received your letter relative to the perpetual motion.

C. A., of Ohio—Your improvement in catter bars is not new to us. Think it could not be patented.

R. Mac D., of Tenn.—Your improvement in water wheels is a good one, and it appears to be patentable.

S. W., of N. Y.—You should get an engraving of your invention published in the SCIENTIFIC AMERICAN. It will do you good.

J. T., of England—We regard the wit of the person you allude to, as made up of the nips and scraps of London six-penny literature—it is trash.

H. T., of N. J.—Galvanized iron is very durable in some situations, but we have been informed that it is not equal to tin.

S. F., of Pa.—If you mix boiled oil with hydraulic cement, it will make a good paint for outdoor coarse work.

Claussen Brothers, Charleston, S. C., desire to know where they can get the best improved cracker end bread oven.

S. M., of Ohio—Your mode of enabling locomotives to ascend inclines is not new and cannot be patented.

A. McD., of N. Y.—The stream tin of Cornwall is a source of great wealth to England: no tin plate is manufactured in the United States.

M. T. W., of Mass.—Oil gas does not require to be washed in lime water—it is merely cooled by passing it through a water tank.

H. VanT., of Pa.—Your clover huller appears to be new in some of its parts, especially the channels for the refuse and the good clover seed.

A. C. C., of Conn.—You can coat your nails with tin by cleaning them with muriatic acid and dipping them in molten tin.

J. J., of N. Y.—We treat such fellows as the one you refer to with silent contempt. No one will believe him where he is known, so it makes no matter how much he may write about us or what he may say. The paper he commuicates with has no moral character.

S. O. D., of Vt.—We really do think it would be a good plan for you to preserve potatoes to be carried to New York in the manner proposed by you.

T. F. M., of Pa.—We are of the opinion that trains may be run at one hundred miles per hour; but would a road constructed for the purpose pay, that is the question.

M. P., of N. J.—The use of an alkaline lye to steep flax in, is not new, and is therefore not patentable.

M. Mc G., of Ky.—Your brick press may be a very good one, but you have not explained it clearly

Money received on account of Patent Office business for the week ending Saturday, Feb. 17:—

J. M. B., of N. Y., $30; M. S. K., of Pa., $52; J. H. McG., of O., $100; J. S. M., of N. Y., $32; W. S., of O., $30; N. W., of Ala., $10; R. W., of Ct., $100; W. M., of N. Y., $25; M. S., of N. Y., $50; C. C. R., of Pa., $25; S. G. P., of Ct., -15; C. Van H., of Mass., $30; B. & S., of Ct., $40; J. A., of N. Y., $25; A. J. S., of N. Y., $25; R. L., of Ct., $55; L. B. D., of R. I., $25; C. W. L., of R. I., $25; T. J. Van B., of N. Y., $55; L. M. W., of N. Y., $30: W. G., of S. C., $50; L. C. S., of Ct., $25; C. W., of Ct., $42; E. R., of O., $5; J. G., of N. Y., $25; P. L., of Mich., $30; W. H. S., of R. I., $25; W. T. H., of R. I., $10; J. H., of N. Y., $25; E. Y., of Pa., $30; J. D., of Ill., $30; W. D., of N. Y., $30; C. W. C., of Mass., $30; E. F. B., of Ct., $25; A. J. S., of N. Y. $25; F. & McC., of Pa., $30; J. N., of N. Y., $10; E. A. J., of N. Y. $25; S. W., of Mass., $10; J. B., of Ky., $50. W. A., of Ky., $30; J. S. M., of N. Y., $12.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Feb. 17:

E. F. B., of Ct.; G. L., of N. Y.; C. W. L. of R. I.; C. W., of Ct.; R. W., of Ct., (2 cases); J. W. A. o Tenn; J. A. J., of N. Y.; W. T. M., of Pa.; W. H. S, of R. I.; J. A., of N. Y.; A. L., of Pa.; J. H., of N. Y.; J. S. M., of N. Y.; N. W., of Ala.; A. J. S., of N. Y.; J. G., of N. Y.: B. & S., of Ct.; J. W., of Ct.; C. C., of Mich.; H. L., of N. Y.; L. C. S., of Ct.; G. G., of Ct.; E. Y., of Pa.; C. C. R., of Pa. J. A., of N. Y.

Important Items.

MODELS—We are receiving almost daily, models of inventions which have not the names of their inventors marked upon them. This usually prevents us from taking any notice of them whatever. We shall esteem it a great favor if inventors will always attach their names to such models as they send us. It will save us much trouble, and sometimes prevent the model from being mislaid.

BACK NUMBERS AND VOLUMES—We have the following numbers and volumes of the SCIENTIFIC AMERICAN, which we can supply at the annexed prices:—Of Volume 5, forty numbers; price in sheets, $1; bound, $1,75. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Volume 7, all; price in sheets, $2; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Volume 9, complete in sheets, $2; bound, $2,75.

☞ We are able to furnish all the back numbers of the present volume of the SCIENTIFIC AMERICAN, and to new subscribers we shall continue to send the back numbers as long as we have them, so as to render their volumes complete.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

RECEIPTS—When money is paid at the office for subscriptions a receipt for it will always be given, but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgement of the receipt of their funds.

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American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—MESSRS. MUNN & CO., Publishers and Proprietors of the SCIENTIFIC AMERICAN, continue to prepare specifications and drawings, and attend to procuring patents for new inventions in the United States, Great Britain, France, Belgium, Holland, Austria, Spain, etc., etc. We have constantly employed under our personal supervision a competent board of Scientific Examiners, which enables us to despatch with great facility a very large amount of business. Inventors are reminded that all matter intrusted to our care are strictly confidential, and hence it is unnecessary for them to incur the expense of attending in person. They should first send us a sketch and description of the invention, and we will carefully examine it, state our opinion, and the expense of making an application, if deemed new and worthy of it. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country. Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps toward making an application.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

It is very important that trustworthy and competent agents should be employed in securing patents, as great care is necessary in the preparation of the papers, as well as integrity in taking proper care of the case until the inventor is duly invested with his legal rights. Parties intrusting their business in our hands can rely upon prompt and faithful attention. Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that the largest proportion of patents applied for in the U. S., go through our agency.

The offices of Messrs. Munn & Co.'s American and Foreign Patent Agency are at 128 Fulton Street, New York; London, No. 32 Essex st., Strand; Paris, No. 29 Boulevard St. Martin; Brussels, No. 6 Rue D'Or.

TURBINE WATER WHEELS—The Ames Manufacturing Company, Chicopee, Mass.—After a series of experiments for several years, and the adoption of all the modern improvements, including the patents of Uriah A. Boyden, have succeeded in perfecting the Turbine Water Wheel so that they can confidently offer to the public the best Wheel now in use, particularly where great economy of water may be desirable. These Wheels have been adopted in many of our large cotton factories and iron works where large and uniform power is necessary, and we are confident they will give satisfaction to any who may wish to avail themselves of the full benefit of their water power. Cotton machinery of all kinds, shafting and machinists tools, also furnished on reasonable terms, by Ames Manufacturing Co., Chicopee, Mass. Any information will be furnished on application to JAMES S. AMES, Agent. 24 8

STATIONARY STEAM ENGINES FOR SALE—Horizontal Engines with iron bed frames and Judson's Patent Valves, good, strong, substantial, plain finished, that will do good service, say from 4 horse power, $215, to 30 horse, $1,037. Pumps, Boilers, and fixtures can also be supplied when needed. Address, e3wtf S. C. HILLS, 12 Platt st., New York.

PARTNER WITH $500—$1000 WANTED—A celebrated chemist, formerly Professor of Chemistry in Germany, where he was making a great many practical inventions, intends to establish a chemical manufactory. Address H. C. G., Stapleton Post Office, Staten Island. 1*

TWO SECOND-HAND SIX-HORSE STEAM ENgines for sale, one horizontal with boilers complete, price $300, and one upright, in complete order, good as new, price $175. Also one Two-horse Engine and Boiler, has been but little used, price $150. THE WELLS MACHINE WORKS, 29th street & 11th Ave, New York. 1*

MUSIC—PRESCOTT & BROTHERS make, at Concord, N. H., after their own patented invention (April 17, 1849,) the best Melodeons, Seraphines, and Reed Organs to be found in the country, and at lower prices for the quality. 23 3*

MACHINE GROUND CIRCULAR SAWS—(Patent applied for.) Mill men would do well to try these saws, are perfectly free from thin or thick places, can be used thinner and with less sett, and run faster than any other hitherto made. All diameters and thicknesses warranted perfectly true. HENSHAW & CLEMSON, 31 Exchange street, Boston. 19 8*

WIRE ROPE OF IRON AND COPPER—For Mines, Inclined Planes, Hoisting and Steering purposes, Stays or Braces, &c., &c., much safer and far more durable than the best hemp or hyde ropes. Also for Sash Weights, Dumb Waiters, Lightning Conductors, &c. CHARLES W. COPELAND, No. 64 Broadway. 14 eowtf

THE ARTISAN JOURNAL—A Monthly Record of the Process of Civil and Mechanical Engineering, Steam Navigation, Shipbuilding, and the Industrial Arts, Chemistry, &c. Published in London, and for sale in numbers and volumes by CHAS. H. HASWELL, Consulting and Superintending Engineer, Bowling Green, New York. Drawings and specifications of Steam Machinery, in all its branches, furnished upon application. 14 1amtf

TECHNICAL DICTIONARY—In the English, French, and German Languages; by Messrs. Tolhausen and Gardissal, Civil Engineers. Ready (first part). French, English German, price $1,31; (second part) English, French, German, price $1,50. These volumes are designed for the general use of Engineers, Artists, Manufacturers, Foremen, Artisans, in short, of all those who, in some way or other are concerned in Arts and Manufactures. The present work is the key through which the foreign reader may penetrate into a language which he may know but imperfectly; it is the instantaneous translator of the corresponding technical term, or its equivalent, in the three great industrial languages. For sale at this office.

LAWRENCE SCIENTIFIC SCHOOL—Harvard University—The next Term of this Institution will open on the first day of March, 1855, and continue twenty weeks. Instruction by Recitations, Lectures, and Practical Exercises, according to the nature of the study, will be given in Astronomy, by Messrs. Bond; Botany, by Prof. Gray; Chemistry, Analytical and Practical, by Prof. Horsford; Comparative Anatomy and Physiology, by Prof. Wyman; Engineering by Prof. Eustis; Mathematics, by Prof. Pierce; Mineralogy, by Prof. Cooke; Physics, by Prof. Lovering; Zoology and Geology by Prof. Agassiz. For further information concerning the School application may be made to Prof. E. N. Horsford, Dean of the faculty.
Cambridge, Mass., January, 1855. 23 2*

NEW HAVEN MANUFACTURING COMPANY Machinists' Tools. 65 Iron planers of all sizes: 350 Engine and Hand Lathes, all sizes; 50 Upright and Horizontal Drills; 25 Bolt Cutters: 10 Gear Cutters; all kinds and sizes of Chucks, Slide Rests, Hand Drills, &c. These tools are of superior quality, and as they are built by the quantity, can be afforded and will be sold at low rates. For cuts giving full description and prices, address New Haven Manufacturing Co., New Haven, Conn. 21 tf

TO MILLERS.—BOOTH'S PATENT GRAIN SEPARATOR—Manufactured at Cuyahoga Falls, Ohio, warranted to be the best thing of the kind ever used for milling purposes, with horizontal and perpendicular blast, also improved shaking riddle of perforated copper, giving a smooth surface, cleans from 10 to 500 bushels per hour of wheat, corn and buckwheat. Sections where garlic, oats, smut balls, etc., are troublesome, it is indispensable to the manufacture of good flour. A more particular account will be given by addressing the manufacturer at Cuyahoga Falls, Ohio.
21 6* J. L. BOOTH.

PORTABLE STEAM SAW MILL ENGINES—Silver Medals awarded by the Franklin Institute and Pennsylvania State Agricultural Society in 1851, 1853, and 1854. A number of these engines are now at work driving portable up and down, and circular saw mills, also mills where the water power has failed Circulars will be sent by addressing the inventor, A. L. ARCHAMBAULT, 15th and Hamilton sts., Philadelphia, Pa. N. B. Portable engines always on hand. 22 4*

ELECTRO MAGNETIC MACHINES—Telegraph Registers, Receiving Magnets and keys manufactured and for sale at No. 3½ South Seventh street, Philadelphia, by W. C. & J. NEFF. 22 7

ANGLO AMERICAN AGENCY—Office No. 20 Hatton Garden, London, for the introduction and sale by commission of American Manufactures, machinery, Inventions, and articles suitable for the European and British markets. Parties desirous of introducing their goods to the notice of the European public, will find this the most advantageous, direct, and economical method. All communications must be post-paid, addressed to No. 20 Hatton Garden, London. 21 4

A CLIPPER AMONG THE MONTHLIES—The Monthly Nautical Magazine, devoted exclusively to the Maritime interests of the United States, embracing ship-building commerce, navigation, and marine engineering—will commence it second volume in April, 1855, enlarged to 96 pages. This work contains draughts of some of the finest vessels of the age, with other engravings, and is one of the most valuable publications in the country. Terms, single copies $5 per annum, or $2,50 per volume. Club Rates—Five copies for $20: twelve copies for $50. Sample copies sent when requested. Address GRIFFITHS & BATES, Editors and Proprietors, 79 John st., New York. 21 4

TENON MACHINES—To Correspondents and others—A machine may be seen in operation at and during the present Exhibition of the M. Mech.'s Institute, Washington City. B. R. EAMES, Agent. C. P. S. WARDWELL, Patentee, Lake Village, N. H. 23 3

THE FRENCH EXHIBITION—Parties who have applied for space in the French Palace of Industry, and who do not intend to be present at the Exhibition, are recommended by the undersigned to arrange with Messrs. Gardissal & Co., No. 29 Boulevard St. Martin, Paris, who are prepared to put upon Exhibition, attend, and effect sales of articles intrusted to their care. It is a responsible concern. S. H. WALES, State Commissioner, Scientific American Office.

BUFFALO MACHINERY DEPOT—Terrace St. and 36 Lloyd st., Buffalo; J. W. HOOKER, Proprietor, H. C. Brown, Superintendant, offers for sale Machinists' tools of all kinds: Engine Lathes, Planers, Drills, Chucks, Boring Mills; also machinery of all kinds on hand or furnished to order. 7tf

STAVE AND BARREL MACHINERY—Hutchinson's Patent. This machinery which received the highest award at the Crystal Palace, is now in daily operation there. Staves, heading, &c., prepared by it are worth to the cooper 20 to 40 per cent. more than when finished in any other way. Special attention is invited to the improved Stave Jointer. Apply to C. B. HUTCHINSON & CO., Crystal Palace, or Auburn, N. Y. 13 tf

PATENT DRIERS—Zinc Driers, Graining Colors, Stove Polish, Gold Size, &c., &c., 114 John street, New York. QUARTERMAN & SON, Manufacturers. 1 6m

HARRISON'S GRAIN MILLS—Latest Patent.—$1000 reward offered by the patentee for their equal. A supply constantly on hand. Liberal Commissions paid to agents. For further information address New Haven Manufacturing Co., New Haven, Conn., or to S. C. HILLS, our agent, 12 Platt Street, New York. 13 tf

NORCROSS ROTARY PLANING MACHINE—The Supreme Court of the U.S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks, is not an infringement of the Woodworth Patent.

Rights to use N. G. Norcrois's patented machine can be purchased on application to N. G. NORCROSS, 208 Broadway, New York.

Office for sale of rights at 208 Broadway, New York; Boston, 27 State street, and Lowell, Mass. 16 6m*

CHEAP LIGHT—A. M. MACE, manufacturer of atmospheric or Benzole Gas Machines: size from 2 to 1000 lights. All orders promptly executed corner of Main street and Harrison avenue, Springfield, Mass. 15 3m*

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A. B. ELY, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Messrs. Munn & Co., Scientific American. 16 1y*

VAIL'S CELEBRATED PORTABLE STEAM Engines and Saw Mills, Bogardus' Horsepowers, Smut Machines, Saw and Grist Mill Irons and Gearing, Saw Gummers, Ratchet Drills, &c. Orders for light and heavy forging and castings executed with dispatch.
8 1y* LOGAN VAIL & CO., 9 Gold st., N. Y.

NORTHVILLE MACHINE WORKS—Manufactory of Machinists Tools, consisting of Engine Lathes, Power Planers, Hand Lathes, Engine Lathe for turning chair stuff, all of the most improved patterns and quality of workmanship. Worcester, Northville, Mass., August 1854. TAFT & GLEASON. 50 1y*

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Science and Art.

History of Reaping Machines.—No. 20.

On the 1st of July, 1851, A. Palmer and S. G. Williams, of Brockport, N. Y., obtained a patent, the claim of which, on page 342, Vol. 6, SCIENTIFIC AMERICAN, is as follows: "discharging the cut stalks and heads of grain from the platform by means of the combination of the rake with the lever, and the cooperation therewith of the series of teeth on the face of the wheel, and the inclined rail rising above the curved guard of the platform." The object of the invention relates to self-raking.

On the 8th of July following a patent was granted to Wm. Jones, of Bradford, Vt., for a rotating cutter. See claim, page 350, Vol. 6, SCIENTIFIC AMERICAN.

On the same date a patent was granted to Wm. H. Seymour, of Brockport, for an improvement in self-acting rake. See claim on same page.

On the 15th following a patent was granted to Sylvanus Miller, of Urbana, Ohio, for an improvement in harvester rakes also. See claim, page 358, Vol. 6, SCIENTIFIC AMERICAN. This patent was assigned to Palmer & Williams on the 21st November, 1854. The following is the part of Miller's claim which is applied by the assignees to their machines, viz., "the application of a thin light roof to the rakes for harvesters, for the purpose of effecting the separation of the gavel from the falling grain."

On the 23rd September, 1851, a patent was granted to John H. Manny, of Waddams Grove, Ill., for a method of hinging the cutter bar to the side of a triangular frame, to prevent the ends of it from sagging. See claim, page 22, Vol 7, SCIENTIFIC AMERICAN.

On page 54, same volume, is the claim for the re-issued patent of W. F. Ketchum, of Buffalo, N. Y.

As there is much diversity of opinion respecting who is the inventor or inventors of certain parts of reaping machines, we deem it our duty to publish as much fair information on these subjects as we can obtain. The following is another important letter from a correspondent in relation to the controverted question, "who is the inventor of the *zig-zag sickle*:"—

CORRECTION No. 2.—In No. 20 of the SCIENTIFIC AMERICAN, I see a letter of Messrs. Seymour & Morgan, in which they say that Moore & Hascall are entitled to the credit of the invention of the zig-zag sickle." I was of the same opinion until last spring, when a couple of gentlemen from Michigan, and neighbors of Mr. Moore's, informed me that John Leland was the inventor and maker of the first zig zag sickle used by Moore & Hascall in their sixteen horse reaper, in 1838. The names of these witnesses and others I can procure if the question should become of sufficient importance to "justify," as the Suckers say. The zig-zag sickle is the main and probably only important device sought to be secured by Mr. Moore, in his curious bill that has been pending in Congress two or three years. I became acquainted with Mr. Moore in Washington two years ago, and was much interested in his favor.

I hope Congress will dispose of the subject of patent extension at once. Not one of these applicants have a right to what they claim, nor has Congress power by the Constitution to grant what they ask, and the country should not be kept in a state of alarm at the threatened wrong. HENRY GREEN.

Ottawa, Ill, Feb. 6, 1855.

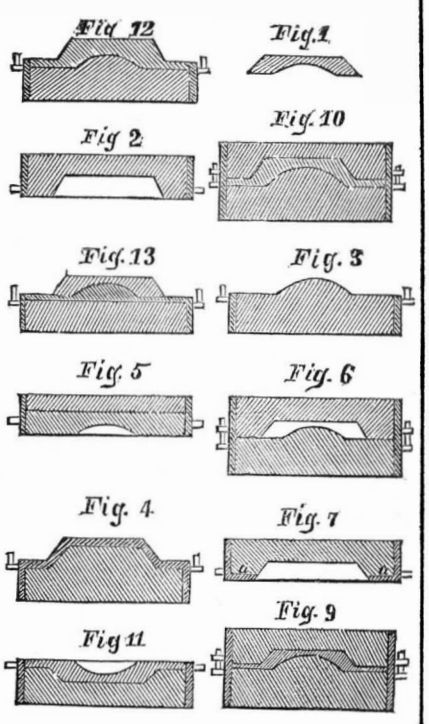
Copper Smelting in Tennessee.

It is said that a project is now on foot to establish works for smelting copper ore at Chattanooga, Tenn., to accommodate the rapidly increasing mining interests of East Tennessee and North-Western Georgia. The intention is said to be to do away with the general practice of shipping ore to Baltimore, which has hitherto been considered a matter of necessity.

Improvements in Molding.

Every improvement in molding is of vast importance to a very large class of our people. We do not know any branch of business that is more universally spread throughout the length and breadth of our land. Every improvement, therefore, in this art, wherever invented, when we can do so in a proper manner, we endeavor to present to our readers.

The annexed engravings illustrate an improvement in molds for casting metals, for which a patent was granted to John and Robert Jobson, iron founders, England, and published in the last number of the last volume (45) of that excellent work, *Newton's London Journal*:



"In molding, according to this invention, a pattern of the article to be cast is prepared, which may be of iron, wood, or other suitable material. Thus, if it be required to prepare molds for the casting of a plate of the sectional form shown at fig. 1, a pattern is prepared, and two molds are made from the same, in sand or plaster of Paris, or other suitable material, which will present the forms shown in figs. 2 and 3. An empty molding box is then placed on the mold, fig. 2, and an alloy of lead and tin, or zinc and tin, or other suitable metal or alloy of metals, is poured in, until the mold is covered thereby. When the plate deviates considerably from a flat surface, a core or cores of sand or other suitable material may be introduced at parts, so as to displace a portion of the fluid metal, and render a less quantity of the same sufficient to cover the mold. Pins or screws, or other projecting pieces, attached or not to the molding-box, as may be most convenient, are introduced into the metal, and when it has solidified, the box is filled with Roman cement or other suitable material, so as to form a ramming-block with a metallic face or surface, fig. 4; or the blocks may be made entirely of metal or alloys of metal. Another ramming-block, fig. 5, is made in a similar manner from the mold, fig. 3. A molding-box is placed on each of these ramming-blocks, and sand or loam is rammed in, and the two sand molds thus made are placed together, as in fig. 6, to form the complete mold for receiving the melted iron or other metal, suitable passages being left in the sand for the purpose. The frames or boxes are provided with pins and holes which fit corresponding holes and pins in each other, and in the ramming-blocks.

Instead of introducing cores to displace a portion of the metal, as above mentioned, an additional pair of molds, of sand or other suitable material, are sometimes prepared, as shown at figs. 7 and 8, from the original pattern, and a portion of the sand is scraped away, as shown by the lines, *a a* and *b b*.—These molds are then placed in contact respectively with the molds, figs. 3 and 2, as shown in figs. 9 and 10, and the alloy of lead and tin, or other metal or alloy of metal, is poured into the same, through suitable passages made in the sand or other material for that purpose. The plates thus made—when backed with Roman cement or other suitable material, after taking out the sand, but before the boxes have been separated or the plates displaced—form the ramming-blocks shown in figs. 11 and 12, which are employed in a similar manner to those shown in figs. 4 and 5.

It will be seen that the partings of the sand, or the surfaces of the sand which come in contact with each other in the complete mold, fig. 6, as well as the mold of the article itself, are thus molded on metallic surfaces. The molds are thus made with great accuracy, and also with great facility, as the molder's skill is not required to produce a good parting.

In lieu of pouring melted metal into the mold to form the face of the ramming-block. an empty box is sometimes fixed upon the mold, figs. 2 or 3 (which for this purpose, may be of plaster of Paris); and this box is luted on in a water-tight manner, and filled with a solution of sulphate of copper, or other suitable metallic solution, and the copper or other metal, or mixture of metals, is deposited on the surface of the mold by means of the electrotype process. The mold is previously prepared with wax, or other suitable material, to prevent it from absorbing or being acted upon by the metallic solution; and it is rendered capable of conducting electricity by means of black-lead or other suitable conducting material, as is well understood. When a sufficient coating of copper or other metal has been thus deposited, the solution is removed, and the plate backed, if necessary, with lead and tin or other suitable metal or alloy of metals, and the box filled up with Roman cement, or other suitable material. Screws or pins, or pieces of metal, are placed on the surface while the metal is depositing; and these pieces of metal become attached to the deposit, and serve to connect it firmly to the cement backing. The ramming-blocks thus made are similar to those shown in figs. 4 and 5, and are employed for forming the sand molds in a similar manner.

If a box of iron or other material, capable of being injuriously acted upon by the sulphate of copper or othor metallic solution, is employed, it is to be coated with grease on the inside, or otherwise protected from the action of the solution. A wooden box, lined with pitch or with gutta percha, may be employed while the metal is being deposited; and this box may be removed and replaced by an iron box when the deposit has acquired a sufficient thickness, and the iron box is then filled up with the backing, as hereinbefore described.

The patentees also prepare ramming-blocks consisting of lead and tin or other metals, or partly of metal and partly of Roman cement or other suitable backing, and having the original pattern attached to one of such ramming-block, in a similar manner to that described in the specification of Mr. John Jobson, patent dated October 2nd, 1852. In this mode of proceeding, the two molds, figs. 2 and 3, are made from an iron or metal pattern, fig. 1. This pattern is then laid on the mold, fig, 2, after attaching some hooks to its back, and an empty box is placed over it, and an alloy of lead or tin, or zinc and tin, or other suitable metal or alloy of metals, is poured into the box so as to cover the pattern. Hooks or pins are placed in the liquid metal, and when it has cooled, the box is filled with Roman cement or other suitable backing. The ramming-block, fig. 13, is thus produced. Or the box may be completely filled with the melted metal if preferred. The other ramming-block is made as above described, or as described in the specification before referred to, by making a reverse mold in plaster or sand, from the mold, fig. 3, and again taking a cast from this reverse mold in cement, which will then produce a ramming-block of the form shown in fig. 3."

Polishing Slate

Dr. Benj. Workman, in a letter read before the Natural History Society, of Montreal, mentions that a process has been recently discovered by which slate may be rendered white in color, and made to take a polish like alabaster or Carracca marble. This transformation is produced by the use of certain chemicals and the application of friction.

Important Discovery.

A paper states that Dr. Griseler, a French gentleman, has discovered that by adding a few drops of nitric ether to the most rancid oils, all the disagreeable smell is removed, and that by afterwards warming the oil, to separate the spirit from it, it becomes as clear and as limpid as though it had never been otherwise than sweet. He says that a few drops of ether in a bottle of oil will prevent it from ever becoming rancid.

LITERARY NOTICES.

ANNUAL OF SCIENTIFIC DISCOVERY FOR 1855—The above named work, edited by Prof. D. A. Wells, and published by Gould & Lincoln, Boston, has been issued since the last No. of the SCI. AM. was published; it is embellished with a fine steel plate of Lieut. Maury, and contains about 400 pages of closely printed matter, embracing, in a condensed form, the principal discoveries that were made during the past year, in the Arts and Sciences. A large and interesting chapter is devoted to mechanics and useful arts; another to natural philosophy; the third to chemistry; the fourth to geology; the fifth to botany; the sixth to zoology, and the seventh and eighth are devoted to astronomy and geography. It is literally packed with useful information, selected with great care; quite a number of articles are from the columns of the SCI. AM., and honorable credit given. It should meet with an extensive patronage, for it is worthy and does great credit to its author.

WEALTHY CITIZENS OF NEW YORK CITY—M. S. Beach, Esq., proprietor of the *Sun* newspaper, has just issued the twelfth edition of the Wealth, and Biography of the Wealthy Citizens of this city. It is an interesting pamphlet of about 100 pages, containing the names of nearly all the citizens of this Metropolis, whose wealth is estimated at one hundred thousand dollars and upwards, with a short biography of most of them, in which is related the manner and kind of business pursued by which their wealth has been amassed. In looking over its pages it is surprising to see what a majority of the wealthy men of this city have made their own fortunes—how few of the number, comparatively, are indebted to their ancestors for their present wealth and position.—Price of the book, 25 cents. Address M. S. Beach, Sun Office, New York.

MASSACHUSETTS MECHANICS CHARITABLE ASSOCIATION.—We have received a copy of the Annals of the Massachusetts Mechanics Charitable Association, compiled by the venerable Joseph T. Buckingham, of Cambridge. It is a very interesting work; every mechanic in Massachusetts should have a copy of it. The Association has been in existence sixty years, and is now in a flourishing condition. It is ornamented with steel plate likenesses of Paul Revere, J. T. Buckingham, and Benjamin Russell.

MAP OF CALIFORNIA MINES—We have received from M. Milleson, C. E., of San Francisco, his improved topographical map of the Northern and Middle Mines of California, and showing a practical route for the Atlantic and Pacific Railroad through the Sierra Nevada at Fredonyer's Pass. It is a very useful map and does credit to its author, and to Alex. Zakreski, who lithographed and published it.

Inventors, and Manufacturers

The Tenth Volume of the SCIENTIFIC AMERICAN commenced on the 16th of September. It is an ILLUSTRATED PERIODICAL, devoted chiefly to the promulgation of information relating to the various Mechanic and Chemic Arts, Industrial Manufactures, Agriculture, Patents, Inventions, Engineering, Millwork, and all interests which the light of PRACTICAL SCIENCE is calculated to advance.

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